# Petroleum news



Vol. 12, No. 8 • www.PetroleumNews.com | *A weekly oil & gas newspaper based in Anchorage, Alaska* | Week of February 25, 2007 • $1.50

## February Mining News inside


**Here are just a few of the headlines in this month's North of 60 Mining News: Pebble East goes richer and deeper; Imperial prevails in BcMetals bid; Nixon Fork ships first gold doré; B.C. to extend power to Red Chris area; Alaska approves Pebble exploration plans; Alaska Legislature attacks Pebble; Explorers going wild in British Columbia.**

## PN sources say Eni buying Anadarko out of Nikaitchuq; Milan approved development after successful production test; Canada told to forget Arctic claims


PETROLEUM NEWS SOURCES said Feb. 22 that Eni has purchased Anadarko Petroleum's 70 percent interest in the Nikaitchuq prospect, making Eni 100 percent owner in the Alaska Beaufort Sea unit.

State of Alaska oil and gas lease records show that an assignment of 20 leases encompassing both the Nikaitchuq unit and adjacent Tuvaaq unit from Anadarko to Eni was

*see* **INSIDER** *page 20*

## BREAKING NEWS



EXPLORATION & PRODUCTION

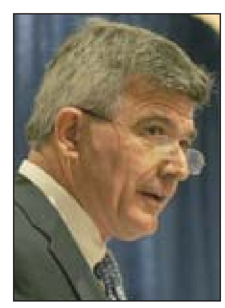
# Shell building legacy

*Alaska 2007 program takes shape; environment, communities high priorities*

By ALAN BAILEY

*Petroleum News*

A flurry of government regulatory filings and announcements in February provides the most visible sign that the clock is ticking towards 2007 field activity in Shell's exploration program for offshore northern Alaska. And on Feb. 21 Petroleum News asked Rick Fox, Shell's asset manager for Alaska, about the company's exploration plans and its vision for its Alaska operations.



JUDY PATRICK

RICK FOX

*see* **SHELL** *page 17*

### MMS approves Shell's exploration plan

The regulatory process for Shell's Beaufort Sea drilling plans passed a major milestone Feb. 15 when the U.S. Minerals Management Service approved the company's eastern Beaufort Sea exploration plan and the accompanying oil discharge prevention and contingency plan. MMS said its analysis found that Shell's plans would not cause "undue or serious harm or damage to the human, marine or coastal environment."

The exploration plan approval only relates to

*see* **PLAN** *page 18*

GOVERNMENT

# Odds against ANWR reserve

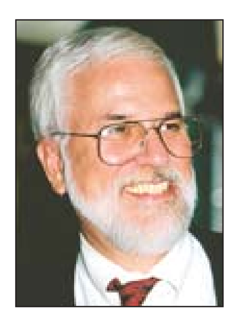
*Consultants: Making refuge part of U.S. emergency petroleum stockpile impractical*

By ROSE RAGSDALE

*For Petroleum News*

Consultants in Alaska most familiar with the controversial debate over drilling for oil in the Arctic National Wildlife Refuge applaud the notion of considering all avenues to find a viable path to development.

But they mustered little enthusiasm Feb. 21 for the idea of making the oil resource believed to lie beneath the refuge's 1002 Area part of the U.S. Strategic Petroleum Reserve. The 1002 Area, or coastal plain, of ANWR is a 1.5 million-acre strip of land that borders the Beaufort Sea at the northern edge of the 19 million-acre refuge. Geologists say it could supply oil to the United States at a rate of 1 million barrels a day for 30 years. Environmentalists, however, say oil development in ANWR would upset the ecological balance of America's last major wilderness.



**"The oil would still be in the ground, in the rock as nature put it there 100 million years ago. It's not like the oil is in a jar." —Ken Boyd**

The idea of putting ANWR in the reserve surfaced Feb. 18 in a Washington Post editorial, where author Gal Luft criticized President Bush's plan to expand the Strategic Petroleum Reserve by purchasing more oil and stashing it in Richton, Miss., not far from Gulf Coast refineries and infrastructure. The SPR currently has

*see* **ANWR** *page 17*

EXPLORATION & PRODUCTION

# Drilling Cosmo this summer

*Pioneer files spill plan for Cook Inlet unit; if OK'd will be produced from onshore*

By KAY CASHMAN

*Petroleum News*

Pioneer Natural Resources Alaska is moving forward with plans to drill a sidetrack appraisal well at its Cosmopolitan prospect this summer. If development of the Lower Cook Inlet unit is sanctioned by the Texas-independent, the offshore oil and gas accumulation will probably be produced from onshore, company President Ken Sheffield told Petroleum News.

"Based on current information and the status of the evaluation today, it is likely that the field would be produced from onshore if ultimately sanctioned," Sheffield said Feb. 21.

A joint state-federal unit offshore the lower Kenai Peninsula, Cosmopolitan was formed in 2001 and contains about 25,000 acres. It has a resource potential of 30 million to 100 million barrels of oil, Sheffield said in a speech last fall.

*see* **COSMO** *page 14*

JUDY PATRICK

**Nabors Rig 273, which drilled the two Hansen wells**

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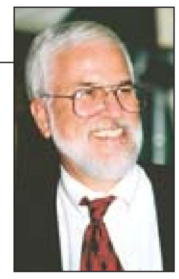
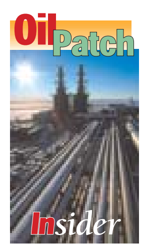
Petroleum News *A weekly oil & gas newspaper based in Anchorage, Alaska*

## ON THE COVER





## OIL PATCH INSIDER






## EXPLORATION & PRODUCTION



## FINANCE & ECONOMY



## GOVERNMENT



## INTERNATIONAL



## LAND & LEASING



## NATURAL GAS



## PIPELINES & DOWNSTREAM

● GOVERNMENT

# All aboard the Kyoto special

*Canadian and B.C. leaders perform about-turns on Kyoto; Harper ready to comply with greenhouse gas protocol; Campbell wants Alaska to be part of Pacific coast coalition*

**By GARY PARK**
*For Petroleum News*

There's a bandwagon lurching its way across Canada these days, creaking under the weight of those scrambling aboard and groaning at the accompanying rhetoric.

Now that politicians of all stripes find themselves agreeing that the science is "right" and climate change is a "fact," they're trying to outdo each other in crafting Kyoto-style environmental strategies, putting themselves in the me-first category to ensure they don't lose touch with environment-haunted voters.


Canadian Prime Minister Stephen Harper

The assortment of wagon riders is especially notable for the latest additions — Prime Minister Stephen Harper and British Columbia Premier Gordon Campbell.


British Columbia Premier Gordon Campbell

Both have been unabashed skeptics of the Kyoto Protocol until the last few weeks.

But they are suddenly undergoing more color changes than a New England fall.

These days they're both red-faced at their failure to act in the past, surrounded by brilliant shades of green as they take up the cause.

### Industry obvious target

It isn't yet clear what all this means for the oil and gas industry beyond the obvious — the sector is painted as the leading culprit of greenhouse gas emissions or GHGs and is an obvious high-profile target for punitive action.

The best the Canadian Association of Petroleum Producers can do is stay calm and keep its powder dry until it sees exactly how far the Canadian and B.C. governments will go to win the political war on the environment.

Industry leaders make a case that companies have already made headway in cleaning up their act and are developing technology to make even greater strides, but they are concerned that the current political momentum will result in onerous regulations that will drive investors elsewhere.

Harper made the most abrupt shift by promising his Conservative government will produce a plan to comply with Kyoto if legislation passed in the House of Commons becomes law.

The bill was adopted by a vote of 161 to 113 on Feb. 14, backed by the three opposition parties — Liberal, New Democratic and Bloc Quebecois.

Harper wasn't even present for the vote, but Environment Minister John Baird said the bill — if ratified by the Liberal-dominated Senate — could not be implemented because it contained no spending provisions.

The opposition parties accused the Conservatives of staging a "coup d'état" and warned there would be a constitutional showdown if the government refused to act on the legislation.

A day later, Harper backed down, saying that "if and when the bill becomes law the government would respect it," while adding that the bill contains no plan of action and gives the government no authority to spend any money.

### B.C. plan leaves rest of country in lurch

While federal politicians were at loggerheads, by far the biggest and most startling package of climate change action landed with a thump in British Columbia on Feb. 14 when the government of Campbell presented the barebones of a plan that leaves the rest of Canada in the lurch.

Not only that, but Campbell wants to "collaborate" with his Pacific coast neighbors in the United States by inviting Alaska, Washington, Oregon and California to "develop a sensible, efficient system for registering, trading and purchasing carbon offsets and carbon credits" as well as establishing common environmental standards for all ports along the coast.

The four state governors will be invited to B.C. this spring to work with Campbell on developing a policy to cut greenhouse gas emissions in the Pacific region.

California Gov. Arnold Schwarzenegger was quick to voice his enthusiasm, welcoming B.C. in the fight against climate change.

"I look forward to meeting with Premier Campbell and working with British Columbia on this issue."

He ought to be enthusiastic. The Campbell government plan, outlined in a speech opening a new session of the provincial legislature, includes adopting California's automobile emissions standards starting in 2009.

One key element involves lowering automobile emissions, which account for 40 percent of B.C.'s GHGs, by requiring new vehicles to lower their emissions by 30 percent over the 2009-2016 period and cutting the carbon-intensity of emissions from all passenger vehicles by 20 percent by 2020.

These objectives probably sounds familiar to Schwarzenegger since BC enlisted help from Terry Tamminen, a consultant in developing California's climate change plan.

### B.C. goal is to be 'carbon neutral'

But now Campbell is talking about outdoing the Terminator, prompting one columnist to ask: So who's the girly man now?

His government's goal is to be the first "carbon neutral" jurisdiction in North America by 2010 with an all-out blitz on several fronts.

A "climate action team," to be headed by Campbell, has the added job of setting interim GHG-reduction targets for different sectors to be implemented in the 2012-2016 period.

The promises include reducing GHGs in the province by at least 33 percent below current levels by 2020, bringing emissions to 10 percent under 1990 levels by 2020. Under the Kyoto Protocol, emissions are supposed to be 6 percent below 1990 levels by 2012.

The government also wants B.C. to be "electricity self-sufficient by 2016."

At the same time it is setting tough new standards for provincially-owned BC Hydro, telling the utility that "all new and existing electricity produced in B.C.will be required to have net zero greenhouse gas emissions by 2016."

Effective immediately, the government is ordering all coal-fired electricity plants to sequester 100 percent of their carbon emissions. That creates turmoil for BC Hydro's plans to build two coal-fired plants, the first for the province.

More details will be included in the province's Feb. 20 budget. Additional energy and climate change programs will be unveiled over coming weeks.

That will be the first chance for the Campbell administration to show how tough it intends to get.

"Voluntary measures have not got the job done," said Environment Minister Barry Penner. "They will have to be manda-

see **KYOTO** page 5

## GOVERNMENT

### B.C. sets water rules for coalbed methane

The British Columbia government is eager to see coalbed methane enter the commercial phase, but not at any price.

It has banned the surface discharge of water from coalbed methane operations, heading off one of the most sensitive aspects of the sector among environmentalists.

Other measures will require reinjections of produced water to occur below domestic water aquifers; the use of the most advanced technology and practices that are commercially viable to minimize land and aesthetic disturbances; and full involvement of local communities and First Nations in all aspects of coalbed methane development.

Energy Minister Richard Neufeld left no doubt that the water reinjection order is not open for debate, noting that the industry was involved in some of the discussions leading up to the British Columbia government's announcement that it plans to reduce greenhouse gas emissions by at least 33 percent below current levels by 2020.

B.C. has yet to join Alberta in commercial production from coalbed methane wells, but the province currently has 134 test wells. For the industry the key unanswered question is how much it will cost to meet the province's standards and whether that will allow coalbed methane to be competitive. That will have to wait for the details.

—GARY PARK



## EXPLORATION & PRODUCTION

# Oil sands to build global presence

*Consulting firm estimates Alberta resource will account for 25 percent of world's unconventional supplies by 2025*

**By GARY PARK**
*For Petroleum News*

More than three decades of research and development in the once-scorned oil sands of Alberta may now be headed for a major payoff.

According to United Kingdom-based Wood Mackenzie, the 175 billion barrel deposit will be a "big driver" as unconventional oil resources surge to 25 percent of total worldwide oil supply by 2025.

A report by the consulting firm said unconventional output, including heavy oil, oil sands and shale oil, will increase over the next 18 years from 8 million barrels per day to 20 million bpd, of which Alberta is forecast to contribute 4 million bpd.

International companies can no longer afford to ignore these reserves if, as expected, conventional non-OPEC supply peaks within a decade, Wood Mackenzie said.

"Not since the 1970s, when the first oil shock occurred, has so much industry focus been directed at unconventional resources," said the report, which estimates the resources at 3.6 trillion barrels of oil equivalent.

"Oil companies, primarily in the U.S. and Canada, have been able to leverage technology developments pioneered in the 1970s to position themselves in the vanguard of unconventional hydrocarbon developments."

Given the challenges of discovering accessible natural gas reserves, international oil companies can't bypass unconventional deposits if they have any desire to grow, said Wood Mackenzie managing consultant Rhodri Thomas. But he cautioned that exploiting the potential will need answers to technical, commercial, fiscal and environmental problems if the international companies are to profit from their investments.

Even so, he told the Calgary Herald, the Alberta "oil sands economic model is robust and the significant reserves will support long-term projects.

"The base fiscal terms for unconventional plays can be more favorable than those available for conventional developments," Thomas said.

The study said oil sands projects should be able to generate internal rates of return of about 10 percent with oil prices at only US$30 per barrel. Even if prices dipped below that threshold he did not expect any developments to be shelved.

#### Wood Mackenzie sees oil staying above US$40

However, Wood Mackenzie has a more bullish view of the outlook for commodity prices. It is counting on oil to remain above US$40.

Thomas said now that the oil sands are gaining global attention much of the skepticism over the deposit's role in global supply is fading, making Alberta a destination for those lacking supplies.

That interest is being spurred by growing challenges in accessing non-OPEC regions and the difficulties of operating in Latin America and Russia.

The report said unconventional oil and gas will meet 20 percent of global needs by 2025, including 40 percent of U.S. gas supply.

On another positive note, Gordon Lambert, vice president of sustainable development at oil sands producer Suncor Energy, said Kyoto Protocol targets won't cause upheavals in northern Alberta provided the Canadian government does not impose excessive regulations to lower greenhouse gas emissions.

After appearing before a House of Commons committee studying environmental legislation, he said Suncor does not anticipate jobs losses or a harsh economic impact if it is required to meet Kyoto standards.

Lambert said the company has invested in environmental measures and improving the efficiency of its operations without any devastating consequences. ●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*Petroleum News and its supplement, Petroleum Directory, are owned by Petroleum Newspapers of Alaska LLC. The newspaper is published weekly. Several of the individuals listed above work for independent companies that contract services to Petroleum Newspapers of Alaska LLC or are freelance writers.*

**Petroleum News (ISSN 1544-3612) • Vol. 12, No. 8 • Week of February 25, 2007**
Published weekly. Address: 5441 Old Seward, #3, Anchorage, AK 99518
**(Please mail ALL correspondence to:**
**P.O. Box 231651, Anchorage, AK 99523-1651)**
Subscription prices in U.S. — $78.00 for 1 year, $144.00 for 2 years, $209.00 for 3 years.
Canada / Mexico — $165.95 for 1 year, $323.95 for 2 years, $465.95 for 3 years.
Overseas (sent air mail) — $200.00 for 1 year, $380.00 for 2 years, $545.95 for 3 years.
"Periodicals postage paid at Anchorage, AK 99502-9986."
**POSTMASTER:** Send address changes to Petroleum News, P.O. Box 231651 • Anchorage, AK 99523-1651.


## LAND & LEASING

### New info call for North Slope, Beaufort

The Alaska Division of Oil and Gas has published a call for new information for the North Slope areawide 2007 and Beaufort Sea areawide 2007 oil and gas lease sales. The call opened Feb. 16 and closes April 17. Supplements to the best interest findings or decisions of no substantial new information will be issued in July.

The sales are tentatively scheduled for Oct. 24.

The original North Slope areawide final best interest finding was issued in March 1998; the original Beaufort Sea areawide final BIF was issued in August 2000. A supplement to both findings was issued in August 2000 and a second supplement to the North Slope finding was issued in July 2002. Those documents are available on the division's Web site: www.dog.dnr.state.ak.us.

—PETROLEUM NEWS

● GOVERNMENT

# AOGCC has Prudhoe gas off-take report

*Some data on Prudhoe Bay study will be available later in February; Point Thomson on hold; friendly audits under consideration*

**By KRISTEN NELSON**
*Petroleum News*

The primary technical efforts on the Prudhoe Bay gas off-take study have been completed, Alaska Oil and Gas Conservation Commissioner Cathy Foerster told Senate Resources Feb. 19.

The study is required, she said, because "Prudhoe Bay is an oil field and in an oil field you don't typically get permission to produce the gas 'til all the oil is gone." Investors will want to know that the gas can be produced before they put money into a gas pipeline from the North Slope, she said, and it is the commission which will determine how much gas can be produced from the field without an adverse impact on oil production.

The commission has been working on a cooperative study with the Prudhoe Bay owners to help the commission determine what an acceptable gas off-take rate will be for a pipeline.

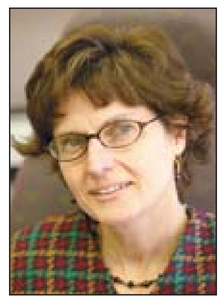
That study will be discussed at the commission's Feb. 28 public meeting, Forester told the committee, but she also said that because the commission has a confidentiality agreement with the owners, "we will not be sharing anymore than they and we feel appropriate to share at this time."

Because such a study involves forecasts, the commission may need to go back and do more studies she said, since forecasts need to be updated.

### Point Thomson study on hold

A comparable study on Point Thomson had just begun late last year, Forester said, when the Department of Natural Resources declared Point Thomson operator ExxonMobil in default on the leases, so that study is on hold.

Grilled by Sen. Bill Wielechowski, D-Anchorage, about why the Point Thomson study is on hold, Foerster said it costs a lot of money to have a consulting reservoir engineer look through the data and if a new operator should come in and gather new data that work would have to be done all over again.


JUDY PATRICK
CATHY FOERSTER

Wielechowski said he didn't understand why the state is waiting for Exxon, since they're in default.

Forester said ExxonMobil owns the data and "they can choose whether or not to share and if they're in default why would they share it with us?" If they no longer have the leases, she said, then the only thing they have of value is the data.

> *Making the decision on an acceptable gas off-take rate will be complex and "we recognize that we need a lot of information that nobody has but the owners and that we have to work a deal with them to get access to it."*
> **—AOGCC Commissioner Cathy Foerster**

The commission negotiated an agreement with the Point Thomson unit owners for access to their confidential data so that the commission could determine the rate at which gas could be removed from the field without an unacceptable loss of liquid hydrocarbons. Point Thomson is neither an oil field nor a gas field, Forester said, but a retrograde condensate reservoir and if such a reservoir isn't produced properly "you could lose liquid hydrocarbons in the reservoir."

The Point Thomson owners had originally proposed producing condensate first and reinjecting the gas for a later sale, but recently opted for gas production at the field in conjunction with the proposed Alaska North Slope gas pipeline project.

Making the decision on an acceptable gas off-take rate will be complex Forester said, and "we recognize that we need a lot of information that nobody has but the owners and that we have to work a deal with them to get access to it."

The data access deal had been struck and a meeting held on sharing the data when DNR came out with its ruling finding Exxon in default. Foerster said she offered to put the study on hold, knowing "they may not have the lease six months from now."

Wielechowski said he was concerned about timeliness for an Alaska gas pipeline and Forester said she thought six months to let Exxon figure out if they want to continue with the study was appropriate. "We can't just sit here for five years and wait for it to be resolved," she said. "We'll have to step in — give them a little time to breathe and then step back in and just see what we want to do."

### Friendly audit under discussion

Forester also said the commission has begun to discuss doing friendly audits, such as those done under Alaska's Occupational Safety and Health Administration program. Alaska OSHA will come in and do an audit and if they don't find any violations that are life threatening or criminal, they'll tell the operator what needs to be fixed and allow 30 days for the work to be done, she said. If those things aren't fixed in the specified time period, then fines are assessed.

AOGCC is bouncing around something similar, Forester said. Other agencies would be invited to participate, she said. ●





*continued from page 3*

## KYOTO

tory. There will have to be consequences."

### Existing five-year plan has no GHG reduction targets

What has stunned many observers is Campbell's apparent total conversion to the climate-change ranks after showing so little enthusiasm for the Kyoto Protocol.

His government's existing five-year climate change plan sets no GHG reduction targets.

The session-opening speech, read by Lieutenant Governor Iona Campagnolo was emphatic that the science on climate change is "clear ... it leaves no room for procrastination. Global warming is real."

It said failure to "act aggressively and shoulder our responsibility" will leave future generations with "shrinking glaciers and snow packs, drying lakes and streams and changes in the ocean's chemistry."

Campbell said 2006 was a "time when frankly the world woke up to the challenges that are created by climate change."

His own epiphany occurred during a recent visit to China when he was troubled by the smog blanketing major cities.

"Citizens are going to have to be part of this," Campbell said. "We're going to ask people to be much more conscious about their personal impacts on the environment."

The petroleum industry was caught off-guard by Campbell's moves, saying it needed more details before it could react.

But uncertainty among oil and gas companies could have damaging results for B.C., which has relied over recent years on oil and gas royalties and land sales as a major revenue source.

For years it has introduced a steady stream of programs and incentives to attract investment and raise output, which now averages about 2.6 billion cubic feet per day of natural gas, about one-sixth of Canada's output, and 140,000 barrels per day of oil, making B.C. the third largest combined producing province after Alberta and Saskatchewan. ●

## LAND & LEASING

### Supplement to BIF issued for Inlet sale

The state's Cook Inlet areawide 2007 oil and gas lease sale will be held May 23 in Anchorage.

The Alaska Division of Oil and Gas said Feb. 21 that the commissioner of Natural Resources has issued a supplement to the best interest finding for the sale, available on the division's Web page at www.dog.dnr.state.ak.us/oil/. The supplement adds a mitigation measure related to Steller's eiders: lease related activities shall be restricted or modified "if scientific evidence documents the presence of Steller's eiders from the Alaska breeding population in the lease area and it is determined that oil and gas exploration and development will impact them or their over-wintering habitat in the near-shore waters of Cook Inlet."

#### Mitigation measures would change if beluga whale listed

The Cook Inlet beluga whale is listed as depleted under the Marine Mammal Protection Act and has been classified as a species of concern by the National Marine Fisheries Service. The division said NMFS is reviewing the status of this population "to determine the need for listing under the Endangered Species Act and is expected to issue a decision in April 2007." If the beluga whale is listed, additional mitigation measures or restrictions would be imposed on relevant tracts "to minimize impacts to the beluga whale in accordance with the law."

The Cook Inlet areawide sale area encompasses some 4 million acres divided into 815 tracts in the Matanuska and Susitna valleys, the Anchorage bowl and western and southern Kenai Peninsula from Point Possession to Anchor Point, on the western shore of Cook Inlet from the Beluga River to Harriet Point and within Cook Inlet.

Bids are due May 21. There is a minimum $10 per acre cash bonus bid on all tracts; all leases will have a fixed royalty rate of 12.5 percent. Length of leases is either five or seven years, depending on tract location.

—KRISTEN NELSON

## EXPLORATION & PRODUCTION

### Facilities piping gas leak shuts in Northstar

Alaska North Slope production was down more than 40,000 barrels per day following shut in of the offshore Northstar field Feb. 17.

A pinhole leak was discovered in piping on the gas compression side of the facility, BP Exploration (Alaska) spokesman Daren Beaudo told Petroleum News Feb. 21.

BP is the field operator, and 98 percent working interest owner; Murphy Oil owns about 2 percent of Northstar.

Beaudo said an operator at the facility spotted an indication of a pinhole leak, a sputtering and some ice accumulation in a spot on an eight-inch discharge pipe. The piping is in one of five stages of drying out the gas before it is reinjected. Beaudo said the low-pressure system piping connects different compression and cooling processes.

#### Pinhole leak at a weld

The pinhole was located at a weld, Beaudo said, and when workers checked other welds they found others that were thinning. The pipe is being replaced rather than repaired, he said, and BP is also inspecting other stages of the gas compression unit.

Replacements and repairs will be made and Northstar is expected to be back online the week of Feb. 26.

Production began dropping at Northstar Feb. 16, with 43,104 barrels produced that day, compared to figures typically above 47,000 bpd earlier in the month. On Feb. 17 production dropped to zero, pulling total Alaska North Slope production into the 750,000-bpd range. ANS production ranged between 780,000 and 808,000 bpd Feb. 1-16.

The field, in the Beaufort Sea some six miles north of the Prudhoe Bay field, is produced from a gravel island with oil going to shore via a subsea pipeline. Production began from Northstar in October 2001 and peaked at 80,000 barrels per day.

—KRISTEN NELSON

● PIPELINES & DOWNSTREAM

# TransCanada gets key to Keystone

*Fending off strong opposition from cadre of Canada's gas producers, pipeliner gets green light from NEB to convert 530 miles of gas mainline in Prairies to take oil sands production to Illinois*

By GARY PARK
*For Petroleum News*

Chalk one up for TransCanada which fended off opposition from a large segment of Canada's natural gas producers in gaining National Energy Board approval to convert 530 miles of its gas mainline in the Prairies to carry oil sands production to Illinois.

TransCanada Chief Executive Officer Hal Kvisle welcomed the NEB's support for an "innovative and cost-competitive solution" to link growing Canadian crude supplies with rising North American demand.

The federal regulator's decision gives a hefty push forward to TransCanada's US$2.1 billion Keystone project, which is being designed to transport 435,000 barrels per day over 1,835 miles from Hardisty in Alberta to the Patoka/Wood River refinery region in Illinois as a possible stepping stone to Cushing, Okla.

So far Keystone is backed by shipping contracts averaging 18 years and totaling 340,000 bpd for a project expected to start construction within about 12 months and start commercial operations in the final quarter of 2009.

The NEB deemed the removal of the gas line in Saskatchewan and Manitoba to be in the "public interest" at a time when the pace of oil sands growth has "fundamentally transformed" Canada's oil sector.

It said high oil prices coupled with technological advances have made oil sands extraction "economically possible, but, among other challenges, this strong growth has led to stress on the pipeline sector."

"It has become clear that, to facilitate market efficiency, more crude oil pipeline capacity is needed to provide new market access for growing oil sands output," the board said.

#### Conversion had strong Suncor support

The gas line conversion had strong support from oil sands powerhouse Suncor Energy, which said that if Keystone misses its 2009 start-up date "Western Canadian crude oil will be stranded."

*With the major Keystone obstacle out of the way, TransCanada has an edge over rival Enbridge, which recently got industry backing for its US$2 billion Alberta Clipper project from Hardisty to Superior, Wis.*

On the other side of the fence, EnCana, BP Canada Energy, Devon Canada, Nexen and Shell Canada were among producers in a group challenging TransCanada's forecasts of throughput on its mainline, arguing the loss of gas transportation capacity could cut into gas producers' revenues.

TransCanada Chief Executive Officer Hal Kvisle welcomed the NEB's support for an "innovative and cost-competitive solution" to link growing Canadian crude supplies with rising North American demand.

"By converting a small segment of our extensive natural gas system to crude oil transmission service, we will maximize the use of an existing asset and still maintain sufficient capacity on our Canadian mainline system to service forecasted customer demand," he said.

TransCanada told the NEB hearings a throughput base case scenario tied to average annual gas flows indicated there could be surplus capacity on the mainline of 1.6 billion to 2.6 billion cubic feet per day over a 10-year period as Western Canada's volumes go into decline.

The NEB said TransCanada had satisfied it that even with the removal of the gas service there would be sufficient capacity to handle current and projected needs.

With the major Keystone obstacle out of the way, TransCanada has an edge over rival Enbridge, which recently got industry backing for its US$2 billion Alberta Clipper project from Hardisty to Superior, Wis. That system is scheduled to start service by late 2009 or mid-2010, with initial capacity of 450,000 bpd. ●

● GOVERNMENT

# Legislature revisits PPT deductions

*Senate begins hearing bill which would exclude costs of repair or replacement of improperly maintained facilities*

**By KRISTEN NELSON**
*Petroleum News*

Both the Alaska House and Senate are considering bills to amend the credit allowance for the Petroleum Profits Tax passed last year so that companies cannot deduct costs of repair or replacement for improperly maintained facilities or for facilities that have not been maintained at all.

Senate Bill 80 had a hearing in Senate Resources Feb. 21.

Senate Resources adopted a committee substitute which adds the commissioner of the Department of Natural Resources to those the commissioner of Revenue will consult with under the bill on maintenance issues (others are the commissioner of the Department of Environmental Conservation and the Alaska Oil and Gas Conservation Commission).


Bill sponsor Sen. Tom Wagoner, R-Kenai

The PPT contains 18 things that could not be deducted as lease expenditures. SB 80 adds a 19th: costs determined by the commissioner of Revenue (in consultation with the commissioners of DEC and DNR, and the Alaska Oil and Gas Conservation Commission) "and taking into consideration the standard practices of the industry" to be "(A) related to the repair and replacement of property or equipment that was not maintained or was improperly maintained; (B) incurred to maintain the operational capability of facilities or equipment shut down because of a lack of or improper maintenance of property or equipment; or (C) incremental operating expenses incurred as a result of operating facilities or equipment at diminished capacity when that diminished capacity is caused by the lack of or improper maintenance of property or equipment."

Sen. Bert Stedman, R-Sitka, noted that the PPT already contains "a whole litany of deductions" including "costs arising from fraud … willful misconduct or gross negligence," and asked how those items compared to items that were not maintained. "It sounds to me like it's related to negligence."

Bill sponsor Sen. Tom Wagoner, R-Kenai, said "a much higher level of proof" was required on those items already in the PPT than is required in the amendment.

The point of this is not punitive, Wagoner said, but to ensure that write-offs have a final review by a committee.

How BP proposes to handle repair and replacement work on the Prudhoe Bay transit lines has been a concern among legislators. Wagoner noted that BP has said it would write off $11 million in credits and they are only one of the owners. One of the reasons for the bill, he said, "is to give that a good review and see if that's allowable or not."

*Bill sponsor Sen. Tom Wagoner, R-Kenai, said "a much higher level of proof" was required on those items already in the PPT than is required in the amendment.*

## Regulations would have to be developed

Tom Bullock, the legislative drafter, said "everything that will be on the PPT returns will be subject to audit by the Department of Revenue."

"What this bill does," Bullock said, "is it sets up a standard that the departments will probably implement by regulations because this language — taking into account the standard practices of the industry — is intended to recognize that there are things that you would normally do when you're maintaining a field, that it's just prudent to do that to avoid repairs: fix something early on rather than wait for a significant failure later." The commissioner, he said, will have to determine what the standards are vs. what was reported on returns.

Senate Resources Chair Charlie Huggins, R-Wasilla, asked Bullock if he was comfortable as a professional that the terms can be described. Bullock said "it's not a matter of legal interpretation; plain meaning would apply to … these terms."


JUDY PATRICK
John Norman, AOGCC

Huggins said he wanted to make sure that the language used works for all parties.

Bullock said he had participated in a meeting with people from the departments named in the bill, "and we discussed the authority for them to define in regulations and to make the determinations as to what the standard practices are." The language in the bill "is general authority to them to go out and figure out what those standard practices so they can apply them appropriately to their audits as they proceed."

## Norman: often no standard practices

John Norman, chair of the Alaska Oil and Gas Conservation Commission, said there are certain standards in place, "they're generally voluntary guidelines" such as those of the American Petroleum Institute and professional societies. If the commission were given this task, Norman said, the commission would need to promulgate regulations and "flesh this out to give meaning."

Often, he said, "there are no standard practices that apply across the board to refer to; in other cases they are evolving just as new technological innovations evolve."

He said it would take "a fair amount of work" to develop regulations.

In a letter to Wagoner, Norman said the commission's "main concern with the bill is the absence of a precise definition of improper maintenance." In some instances, he said, it will be obvious that there has been improper maintenance, but in other cases the commission "will be required to consider design, installation, operation and maintenance … and, making some determinations will require detailed investigation … and application of expertise not readily available within this agency."

Norman said the commission understands and agrees with the intent of the legislation "which is to prevent an operator from shifting financial responsibility to the State for costs resulting from the operator's improper maintenance practices. We do, however, wish to point out some of the practical difficulties that may arise in determining whether maintenance has been improper."

## AOGA opposes bill

The committee only had time to take testimony from Judy Brady, the executive director of the Alaska Oil and Gas Association. Huggins said the committee would continue the hearing; it meets again Feb. 23.

Brady said the AOGA Tax Committee reached consensus opposing the bill.

In lengthy testimony she said AOGA opposes SB 80 for four reasons.

AOGA believes the state is already protected from inappropriate lease expenditure charges under current law.


JUDY PATRICK
Judy Brady, AOGA

The association also believes SB 80 "has unintended, but potentially significant, implications that could well extend far beyond the specific situation at Prudhoe Bay that was the impetus behind the Bill."

AOGA also believes SB 80 is an ex post facto law, and as such is forbidden by both the federal and Alaska constitutions.

"Fourth," she said, "SB 80, because of the ambiguity of its language creates ambiguity throughout the entire PPT legislation related to costs and credits."

Brady said Cook Inlet AOGA members are concerned about the bill because facilities there will "eventually need to be replaced or significantly repaired in order to remain in operation. When those facilities and structures are eventually replaced, there is nothing in SB 80 to protect them from claims that they were 'improperly' maintained" and costs of doing that work could be disallowed. That uncertainty could, she said, lead to facilities or fields being shut-in rather than remaining in production longer. ●

● GOVERNMENT

# Alberta review 'tarnished:' Liberal leader

**By GARY PARK**

*For Petroleum News*

The Alberta government's royalty review panel has stumbled out of the starting gate, facing accusations from two sides: One saying it is stacked in favor of the industry and the other complaining that there is no direct industry representation.

Opposition Liberal leader Kevin Taft wasted no time tarnishing the government's choices for the six-member panel — a collection of former energy executives, oil and gas economists and tax experts — arguing they do not represent the best interests of Albertans.

He also said that by combining royalties and taxes in the same review, Premier Ed Stelmach has left a "huge amount of wiggle room to fudge the royalty question," which was the overriding reason for the exercise.

"We have a tone being set by Stelmach that suggests to me the appetite for royalty change is not significant," Taft said.

New Democratic Party leader Brian Mason doubted the panel could be objective when most members were attached to the corporate sector in some way. "There's nobody representing the true owners of the resource — the people of Alberta," he said.

The panel will be chaired by Bill Hunter, former president of Alberta-Pacific Forest Industries, with more than 30 years' experience in that sector.

The others are: Judith Dwarkin, chief economist for the Ross Smith Energy Group, an independent energy consultant; Andre Plourde, chairman of the economic department at the University of Alberta; Kenneth McKenzie, an economics professor at the University of Calgary; Sam Spanglet, former vice president of oil sands operations at Shell Canada and a director of Atco Power; and Evan Chrapko, chief executive officer of the technology-based Crystal Group of Companies.

Spanglet faced a lot of finger-pointing because he holds "a couple of million" dollars in Shell Canada stock options, but said he saw no grounds for claiming conflict of interest. The government said Spanglet was never asked about his interests in Shell Canada.

### August deadline for recommendations

Finance Minister Lyle Oberg, in naming the panel Feb. 16, said an Aug. 31 deadline has been set for recommendations.

"Albertans must feel confident the royalty structure is meeting the needs of the province," he said.

"This is not a witch hunt. It's got to be fair to both asides," Oberg said.

"As owners of the resources, Albertans are entitled to a fair return. But the royalty structure must also be fair to the industry and not put a stranglehold on future economic growth."

The Canadian Association of Petroleum producers, while disappointed it did not have direct representation, is counting on a chance to outline its views during public hearings which start in April and include stops at Calgary, Edmonton, Fort McMurray and Grande Prairie.

Stelmach agreed to conduct the review after facing a rising tide of criticism, including discontent that oil and gas producers now account for 19 percent of Alberta oil and gas revenues, down from 23 percent in 2001 and 2002, well short of the government's target of 20 to 25 percent.

The review starts against a background of robust industry profits, with Canada's five integrated oil and gas companies tallying profits of C$12 billion in 2006, while independent EnCana reported C$6.5 billion, an historic 12-month high for any Canadian corporation.

The most sensitive issue involves the oil sands, where producers pay 1 percent of gross royalties until project costs are paid off, then 25 percent of their net take.

Also on the table are conventional oil and gas royalties. ●

● FINANCE & ECONOMY

# Oil prices drop below US$59 a barrel

*Commodities strategist doesn't see anything that could push prices either way; upside pressure potential 'quite limited right now'*

**By GILLIAN WONG**

*Associated Press Writer*

Oil prices fell Feb. 21 as traders anticipated a decline in fuel demand after forecasts of warmer-than-average weather in the United States.

Light, sweet crude for April delivery lost 52 cents to US$58.33 a barrel in Asian electronic trading on the New York Mercantile Exchange mid-afternoon in Singapore. The session was quiet, with some Asian traders still away for the Lunar New Year holidays.

The Nymex March crude contract, which expired Feb. 20, fell US$1.32 to settle at US$58.07 a barrel.

Brent crude contract for April delivery fell 46 cents to US$57.52 a barrel on the ICE Futures Exchange in London.

"People are thinking the U.S. weather is going to be much warmer than expected, so heating oil demand should be easing," said Tetsu Emori, chief commodities strategist with Mitsui Bussan Futures in Tokyo.

The U.S. National Weather Service is forecasting above-normal temperatures in the U.S. Northeast — which consumes 80 percent of the nation's heating oil — through March 5.

The National Oceanic and Atmospheric Administration also expected fuel demand in the region to be below long-term averages the week of Feb. 18, the first such forecast in a month.

### Cold February boosted prices

Bitterly cold temperatures in the first weeks of February helped boost oil prices to nearly US$60 a barrel from a 20-month low of US$49.90 on Jan. 18, after an unseasonably warm January.

Emori also said because of a lack of market-moving factors, participants were awaiting the release of U.S. government fuel stocks data due Thursday for price direction.

"At the moment I don't see any specific factors that could push prices either way," Emori said. "The upside pressure potential is quite limited right now."

Data from the U.S. Department of Energy is expected to show domestic crude oil stockpiles rose in the week ended Feb. 16, while distillates are seen falling, according to a Dow Jones Newswires survey of analysts.

Crude oil inventories are expected to build by about 700,000 barrels, according to the mean of nine analysts' forecasts. Distillates, which include heating oil and diesel, are expected to fall by 2.8 million barrels.

Gasoline inventories are seen building by about 100,000 barrels, according to the analysts' average.

"This report is likely to reflect some of the coldest temperatures we've had" this winter, said Phil Flynn, an analyst at Alaron Trading Corp. in Chicago.

Supportive news that Iran may halt its uranium enrichment program and return to negotiations took a back seat to the weather.

One day ahead of a U.N. Security Council deadline, Iran President Mahmoud Ahmadinejad said it was no problem for Iran to halt enrichment, but that "fair talks" demanded a similar gesture from the West.

Traders shrugged off more bullish developments over the weekend, including a fire that caused the shutdown of a U.S. refinery and the kidnapping of three Eastern European oil workers in Nigeria.

Heating oil prices dropped 0.84 cents Wednesday to US$1.6366 a gallon (3.8 liters), while natural gas futures added 2.2 cents to US$7.607 per 1,000 cubic feet. ●

● NATURAL GAS

# North Slope gas hydrate well hits target

*BP-operated Mount Elbert well confirms presence of gas hydrate accumulation and enables coring and testing of gas hydrate zone*

By **ALAN BAILEY**
*Petroleum News*

COURTESY BP EXPLORATION (ALASKA) INC.

A joint government, industry and university team investigating gas hydrate deposits under Alaska's North Slope hit the jackpot in mid-February, when the BP-operated Mount Elbert stratigraphic test well successfully penetrated several hundred feet of hydrate bearing sandstone at Milne Point. Data obtained from the well will enable the scientists engaged in the project to make a more accurate evaluation than ever before of the resource potential of gas hydrates.

"With this project we have significantly increased our understanding of gas hydrate-bearing formations on the Alaska North Slope," said Scott Digert, BP resource manager and the gas hydrate project's technical adviser. "The results also illustrate the value of collaborative research," he said.

Gas hydrate consists of a white crystalline substance that concentrates natural gas by trapping methane molecules inside a lattice of water molecules (methane is the primary component of natural gas). The hydrate crystals remain stable within a certain range of temperature and pressure, but when decomposed the crystals yield about 164 times their volume in methane.

Under the North Slope the gas hydrates permeate relatively shallow sandstones in large trends that straddle the base of the permafrost, around 2,000 feet below the ground surface. And the ability of the hydrates to concentrate natural gas gives rise to some huge estimates of in-place natural gas locked in the hydrate deposits — the U.S. Geological Survey has estimated that those North Slope hydrates may contain as much as 450 trillion cubic feet of methane.

But, although gas hydrates occur in many parts of the world, on ocean floors as well as in areas of permafrost, no one has ever succeeded in continuously producing natural gas from the hydrates. And the economic feasibility of exploiting the hydrates remains unknown.

### U.S. government funding

The huge resource potential of gas hydrates, however, has spurred the U.S. government into funding research into the feasibility of producing natural gas from the hydrates, and the U.S Department of Energy is funding the estimated cost of $4.6 million of drilling the Mount Elbert well. The government wants to understand by 2015 how much of the North Slope in-place gas hydrate resource might be recovered, Ray Boswell, DOE methane hydrates technology manager, said.

The North Slope team has spent the past few years on the first phase of its project, modeling gas hydrate reservoirs, modeling potential ways of producing gas from the hydrates, developing seismic techniques for finding hydrate deposits and mapping potential North Slope hydrate accumulations. Those hydrates lie close to the existing oil industry infrastructure, in a geologic setting where production might be feasible.

"What we believe is that the arctic gas hydrates within sand reservoirs, particularly like the ones we've examined on the North Slope of Alaska in this project, are the most favorable for production," said Timothy Collett, Ph.D., a world-renowned gas hydrate specialist with USGS and a member of the North Slope team.

And the Arctic provides a very good natural laboratory to cost-effectively obtain data from a naturally occurring gas hydrate accumulation, Boswell said.

### First test drilling

Having completed the "desktop phase" of the North Slope gas hydrate research, the drilling of the Mount Elbert stratigraphic test well represents the point at which theory starts to turn into practice. The purpose of drilling the well was to test the seismic techniques used to locate gas hydrates and to obtain detailed data about an actual gas hydrate deposit.

"This is an opportunity to gather the fundamental formation and fluid data that we need to help us really understand the potential performance of the reservoir," Digert said.

Mount Elbert is one of many prospects within what is known as the Eileen trend, one of the two known gas hydrate trends in the central North Slope. Mount Elbert, individually, represents a relatively modest-sized hydrate accumulation but provides a well-defined target for the stratigraphic test, Collett explained. And BP was able to provide seismic data for the Mount Elbert location.

The team used that seismic data to make some predictions about the prospect and then drilled the well to see whether the predictions would prove correct.

"As it turned out our predictions were very correct," Boswell said.

"We did confirm the presence of gas hydrates in our two primary target zones

see **HYDRATES** *page 10*

## GOVERNMENT

# Administration supports integrity idea for new Petroleum Systems Integrity Office

Regulatory gaps were evident after corrosion issues showed up in Prudhoe Bay transit lines last year and both the state and federal governments are working to fill those gaps.

"What is yet unaddressed is a comprehensive view of all of the facilities, not just pipelines, that are concerned with oil and gas activities within the state," Jonne Slemons, acting coordinator of the Petroleum Systems Integrity Office told Senate Resources Feb. 19.

The Murkowski administration promised in August to address these issues, and in October the governor issued an administrative order establishing the Lease Monitoring and Engineering Integrity Coordinator's Office, Slemons said, with a cabinet of nine agency heads involved in oil and gas in the state, a Joint Pipeline Office-type organization with representatives of agencies co-located, under Department of Natural Resources leadership.

The two primary goals were "first, to discover and fill the regulatory gaps regarding oil and gas, and second to ensure the integrity of oil and gas infrastructure within the state," she said. While the Palin administration did not support a JPO-type organization, those two primary goals "were considered by the new incoming administration to be excellent goals," and remain the primary goals of the Petroleum Systems Integrity Office, a leaner and less expensive organization with only four compositions, compared to 10 proposed by Murkowski.

Slemons said an administrative order establishing PSIO is under review by agencies with a role in oil and gas and is expected to be issued shortly. There will be no separate cabinet under the new plan, but the DNR commissioner will be the lead for state and federal coordination, and will designate a Petroleum Systems Integrity Office coordinator.

The coordinator's responsibilities are to conduct a regulatory gap analysis in coordination with other agencies, and then to "fill those gaps in infrastructure oversight." The office will also "review, approve and enforce operator quality assurance programs," following the model used by the state pipeline coordinator's office. In conjunction with the pipeline coordinator's office, the integrity office will coordinate enforcement actions. And the integrity office "will periodically report both to the governor and to the Legislature on the health of our oil and gas infrastructure."

Quality assurance program work will begin at Prudhoe Bay and then proceed to other units. Slemons said the original concept was to do all of the North Slope units first, but she believes that should be reconsidered, and priority based on age of infrastructure, production volumes and past maintenance and performance history.

"Cook Inlet frankly concerns me greatly because of the age of the infrastructure there," Slemons said.

—KRISTEN NELSON



COURTESY BP EXPLORATION (ALASKA) INC.

**Project manager Robert Hunter examines gas hydrate-bearing core from the Mount Elbert stratigraphic test well.**

*continued from page 9*

## HYDRATES

that we were calling the C and B intervals in the Sagavanirktok group," Digert said.

### Drilled to 3,000 feet

Doyon Rig 14 drilled the well to a depth of 3,000 feet from an ice pad 1.4 miles south of the Milne Point B pad, northwest of the Prudhoe Bay oil field. Drilling from an ice pad was necessary because there are no suitable hydrate prospects below any existing gravel drilling pad, Digert explained.

The drillers used an oil-based drilling mud to avoid destabilization of the gas hydrates by the salts within the more conventional water-based mud. And, also to avoid damage to the hydrates, the mud was cooled to about 30 degrees Fahrenheit. A wireline coring system enabled rapid recovery of core from the well, again to ensure that intact hydrate samples could be retrieved for laboratory testing. Several drilling service companies assisted with the drilling and sampling operation.

Once the hydrates samples were recovered they had to be kept cold, to prevent them from decomposing.

In addition to providing samples of gas hydrate-bearing rock, the well enabled a verification of the petroleum geology of a gas hydrate deposit in a relatively shallow reservoir setting.

"We penetrated in the first core a fairly hard shale layer which gave us more confidence that there may be an adequate (reservoir) seal in the shallow sediments," said Project Manager Robert Hunter of ASRC Energy Services.

Following completion of the coring from the well, the team ran a full suite of well logs, followed by a small-scale "micro-dynamics" test of how the gas from the underground hydrates would flow.

### Invaluable data

The well cores, log data and flow test are providing a wealth of information, to enable a better understanding of the potential for gas hydrate production, both on the North Slope and elsewhere.

"We've got a gold mine of data," Boswell said.

The team will now investigate that data to determine, for example, the precise characteristics of the Mount Elbert reservoir and to refine the models for possible gas hydrate production. That investigation might take up to a year, at which point the team will make a decision on the next phase of its project, Digert said.

The plan for that next phase is currently unknown, but could involve drilling another well, perhaps to do a full-scale flow test from the hydrates. A full-scale production test from gas hydrates has never been done and would require new technologies, Hunter said. Another complication arises from the probable need for a gravel drilling pad for a sustained gas hydrate test well, Digert said.

But meantime the team feels more than satisfied with the results from the Mount Elbert well.

"The big deal here is to cut that core and recover it to the surface with stable hydrates in that cold mud, then to run all of our logging tools … and gather those physical and petrophysical data from the zone and … do the (small-scale) flow tests," Digert said.

The well has provided a confirmation of the model for the seismic identification of gas hydrate deposits, enabled the first ever retrieval of North Slope gas hydrate well cores and the second ever test anywhere in the world of the pressure response of gas hydrates, Collett said. ●

● NATURAL GAS

# BP, Exxon stress risk, opportunities

By KRISTEN NELSON

*Petroleum News*

When the Alaska Senate and House Resource committees heard from the North Slope producers on gas pipeline issues in February, the presentations constituted something of a changing of the guard.

Joe Marushack, who has headed up the gas pipeline project for ConocoPhillips for six years, told Senate Resources Feb. 9 that he will shortly be leaving to head up ConocoPhillips' Australia operations (see part I of this story in Feb. 18 issue of Petroleum News). Wendy King, director of external strategies for ConocoPhillips, told House Resources Feb. 14 that the company would be bringing in a replacement for Marushack, assuring the committee "that we have on the ground a very experienced and capable team."

1 2 SERIES

Angus Walker, BP's commercial vice president for Alaska, told Senate Resources Feb. 9 that he's taking over from Ken Konrad as BP's senior vice president for gas commercialization in Alaska.

And Craig Haymes of ExxonMobil told House Resources Feb. 14 that he's recently moved to Alaska from ExxonMobil Canada, replacing Richard Owen as ExxonMobil Production's Alaska production manager.

Company representatives returning to the gas line fray included King, Marty Massey, ExxonMobil's U.S. joint interest manager, and Dave Van Tuyl, BP's Alaska gas commercialization manager.

### Also a changing project

With a new administration, the companies face a new gas pipeline process on terms which haven't yet been made public.

"We understand the governor is considering an RFP process," Massey told Senate Resources. He said the company has "expressed our thoughts to the governor and we are hopeful that a process that will lead to a successful result will be developed." He said ExxonMobil's "key feedback" to the new administration "is that it's important that process not foreclose any options and that it be as flexible as possible."

Van Tuyl said BP thinks the state is "uniquely positioned" to help overcome the challenges of the project.

"We see that happening through an open process that's available to any project sponsor. We think it should be open, with the same rules for all the parties, any party. That would allow the best project to move ahead."

He said BP thinks it is very important to allow the free market to work: "that's where the best ideas are created and certainly a project like this needs good ideas to allow the best project to emerge," he said.

King said ConocoPhillips believes the resource issues have to be addressed to provide "adequate securities to those of us that are going to be asked to make long-term shipping commitments." She said ConocoPhillips wants to continue exploring with the State of Alaska aligning the company's ownership position in the pipeline with its shipping commitment.

*ExxonMobil's "key feedback" to the new administration "is that it's important that process not foreclose any options and that it be as flexible as possible."* **—Marty Massey, ExxonMobil**

"We don't want to rush into a bad deal," she said, "but we think we need to act diligently in trying to find those solutions.

"We want to find new ways to come up with a compromise to move this forward," King said.

JUDY PATRICK

ANGUS WALKER

DAVE VAN TUYL

### What if we hold an open season …

An open season, with gas owners committing to ship gas on a proposed line, is an important part of the process leading up to construction of a gas pipeline, because the firm transportation or ship-or-pay commitments provide surety for those financing the line.

Committee members on both the Senate and House committees asked the producers: what if there is an open season and no one comes?

"One of the worst fears everybody has is we have an open season and no one shows up to participate," said Sen. Bert Stedman, R-Sitka.

He asked BP's Van Tuyl what the state could do to make sure that doesn't happen.

Rep. Craig Johnson, R-Anchorage, co-chair of House Resources, put the question a little differently: "Let's say you're not the chosen pipeline constructor: is there any reason why you wouldn't show up during the open season to make a firm transportation commitment."

Van Tuyl told Stedman that the service that's offered needs to be responsive to customers. "And what that means is that we have a low-cost project that is offered that encourages shippers to participate." Shippers, he said, need to have confidence that the project sponsor can deliver a low-cost project.

The other thing that those making firm-transportation commitments need is confidence that they know the rules, he said, that the resource terms are defined in advance of the open season so shippers know what the fiscal terms will be.

To Johnson Van Tuyl said "you'd want to see a low-cost project and therefore a low toll, a low tariff structure to ensure that we could get our gas to market for a reasonable rate." And the resource owners would need to ensure that the risks they bear have been managed, including the fiscal risk on the upstream business. So, whether or not ConocoPhillips was a pipeline owner, that fiscal risk "would still need to be dealt with in some shape, fashion or form."

### Producers concerned about risk

All of the producers talked about the risks they bear in the project as the resource owners.

Haymes said the Alaska gas project is very significant to ExxonMobil, having the potential to add over 1 billion cubic feet a day of gas sales for the company, equivalent to 10 percent of its current global gas production. And the project could add more than 1 billion oil equivalent barrels of proved reserves, enough to replace a full year of ExxonMobil's production.

But the project will be the largest private investment in North America and because of its size, "many factors impact commercial viability."

The 2001 cost estimate was $20 billion, but since then "steel prices have doubled, industry and construction labor costs are experiencing hyperinflation and there's worldwide pressure on global markets" for contracting services and skilled labor because of world-wide mega projects, Haymes said.

Gas prices remain volatile.

There are many other risks, including "cost overruns, schedule delays and construction conditions, regulatory and state fiscal uncertainties," he said.

BP's Van Tuyl said the project faces three basic kinds of risk: the price the product will actually get in the market; the cost of developing it; and fiscal and regulatory risk.

"Price is set by markets and we are price-takers, not price-makers," Van Tuyl said, as is the state. And the price of natural gas is volatile.

Rising costs are a major challenge for any mega project, he said, but "the Alaska gas pipeline project is not any mega project." It's sheer size, "and we've talked about $20 billion, $30 billion, maybe more," he said. … "Because of its size it's really in a class of its own," and most mega projects exceed their sanctioned cost estimates.

Gas prices have increased, Van Tuyl said, but so have project costs. "And the net result is that the project remains challenged."

Price risk is inherent to any commodity: "it's borne by the resource owners."

The project cost risk is something the North Slope producers manage "through rigorous project management processes," Van Tuyl said. "And as fellow resource owners along with the state we think that careful management of the cost is absolutely critical to maximizing the value of the resource." ●

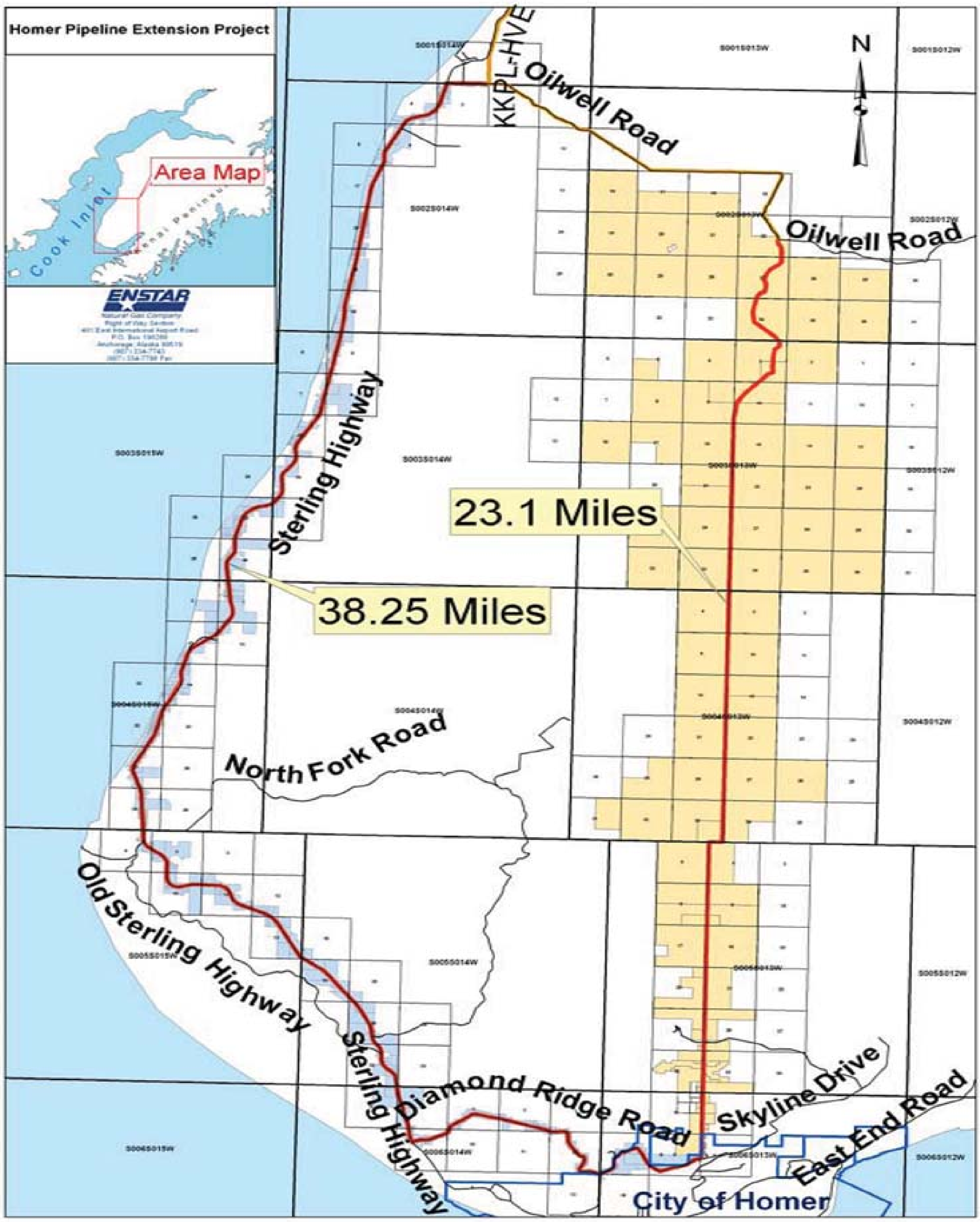
NATURAL GAS

# Enstar moves forward on Homer gas line

*Looking at Cosmopolitan gas; drafts pipeline application for submission in March; if response favorable will start permitting*

By KAY CASHMAN

*Petroleum News*




COURTESY ENSTAR

Curtis Thayer, director of corporate and external affairs for Enstar Natural Gas Co., told Petroleum News Feb. 21 that his company has drafted a South Kenai Pipeline Extension Application for a gas pipeline to Homer, which the Southcentral Alaska utility hopes to submit to the Regulatory Commission of Alaska in March. If Enstar receives "a favorable response" from RCA, Thayer said it would begin permitting the line.

CURTIS THAYER

"We are still working on the exact right of way and once that is completed it will be made public," he said.

In remarks to the Kenai chapter of the Alliance on Feb. 20, Thayer said if everything works out, the southern Kenai Peninsula and Homer could be consuming natural gas by the end of 2009.

"Things are moving in the right direction. A lot of things still need to happen to fall into place, but it is moving," he said.

Thayer said his company has had to "think outside the box" in trying to bring gas to Homer, which is a tiny market. In order to support the price of infrastructure Enstar is looking at both bringing gas south to Homer and taking untapped southern Kenai Peninsula gas north to connect into the existing Cook Inlet gas grid.

Current estimates put the cost of Enstar's transmission lines at $16 million, plus another $14 million for distribution lines (over a five year period).

"For Homer alone that's a tough egg to crack — $30 million to bring natural gas to Homer. But if we're able to connect this system into the Southcentral grid and into the lower Cook Inlet, there's a good possibility that we can do what we call postage-stamp rate-making, where … all of our customers ... could help share those costs for bringing it from Anchor Point (Cosmopolitan) or Red north so we can cut the transmission costs to Homer by half, if half that gas is going to benefit our consumers on the other end."

Enstar, he said, is hoping its proposal to build gas lines to the southern peninsula will stimulate exploration in the area, which currently has no way to get commercial quantities of natural gas to market.

One possibility Enstar is considering is connecting to Chevron's Red well exploration area in the southern peninsula with a transmission line, and taking that gas both north to the Kenai-Kachemak Pipe Line at Ninilchik and, "depending on how much gas they have" also building a line south to Homer, a combination which would involve 23 miles of largely cross-country transmission lines.

The other possibility is to tap natural gas from the as-of-yet undeveloped offshore Cosmopolitan oil and gas prospect six miles north of Anchor Point. It would involve a longer route of about 38 miles that would follow the Sterling Highway from Ninilchik into Homer, he said.

Even though one route is substantially shorter than the other, Thayer said the costs are similar because Enstar has rights of way and roads to work off of for the longer route and would have to go across country for the shorter route.

Thayer referred to Cosmopolitan as a "new and exciting opportunity" that Pioneer Natural Resources Alaska recently brought to Enstar's attention.

"Pioneer," he noted, "is the primary driver behind Cosmopolitan development (see related story on page 1 of this issue) on the southern peninsula.

"Pioneer is the one that came to us and said, 'We have gas. We don't know how much gas we have. Are you interested?' We were obviously interested."

Pioneer's offer "changed the dynamics" for Enstar, Thayer said.

Whatever the utility decides to do, Thayer said Homer would probably get gas.

He said companies exploring for gas in the area are Chevron (Unocal), Marathon, Pioneer and Aurora Gas, while three others — Escopeta, Northstar Energy, Storm Cat Energy — are developing plans to explore for natural gas in the area.

"There are a lot of players out there," Thayer said. "It's a matter of who can come up with the biggest discovery."

Thayer provided a timeline for bringing natural gas to Homer. He said it would take six months for the regulatory work, 12 months for engineering, six months for permitting and the right of way, and 20 months for transmission line construction. Engineering and permitting could begin after the regulatory work was done but construction could not begin until towards the end of the permitting timetable, which would be second quarter 2008. ●

● NATURAL GAS

# Two Gulf LNG terminals approved

*Chevron, independent firm get FERC permission for Mississippi terminals that can import up to 3.1 bcf daily between them*

By **ALLEN BAKER**
*For Petroleum News*

Two terminals a mile apart have been OK'd for importing liquefied natural gas into the Pascagoula, Miss., area, near several major interstate pipelines. The Federal Energy Regulatory Commission announced the approvals Feb. 15.

"Our natural gas markets are changing fundamentally. North American natural gas supply is no longer sufficient to meet North American demand, and LNG will play a more important role in meeting U.S. natural gas supply needs," FERC Chairman Joseph T. Kelliher said in a statement issued with the approvals.

"These are significant import projects, with a combined capacity nearly equal to the projected capacity of an Alaskan gas pipeline."

One of the terminals is to be built by a unit of Chevron Corp. adjacent to a Chevron refinery. The second project is being promoted by Gulf LNG Energy LLC of Houston, a group of private investors including Sonangol, the state oil company of Angola.

FERC also approved a pipeline expansion to serve the Cheniere Energy Inc. LNG terminal in Cameron Parish, La., an increase in capacity of the Maritimes & Northeast Pipelines to import regasified LNG into the U.S. Northeast from Canada, and new natural gas storage of as much as 17 billion cubic feet of gas in salt domes under southern Mississippi.

### Refinery synergies

The Chevron project, a 264-acre development called Casotte Landing, will have some economic advantages due to its location alongside the refinery, which could take some of the natural gas liquids in the gas stream as well as providing waste heat to aid in regasification of the LNG. FERC approved a peak volume of 1.6 bcf of gas daily for the facility.

"There are many inherent synergies with locating a refinery and a natural gas import terminal together, including marine operations and closed-loop regasification," said Roland Kell, Chevron's Pascagoula Refinery general manager.

Gulf LNG has approval for a $450 million terminal that can handle 1.5 bcf per day. The project is planned on land controlled by the local port authority and county, bordering the Bayou Casotte ship channel a mile downstream from the refinery.

### Plenty of LNG ports

FERC has approved more than a dozen new LNG terminals, mostly along the Gulf coast where the nation's web of pipelines is most dense and where public opposition to the terminals is least vocal.

Those approved projects, along with the five already operating, have the theoretical capacity to import more than half of the 61 bcf of gas consumed in the United States each day.

But LNG imports have declined the last two years, with less than 2 bcf daily coming to U.S. shores last year as producers bypassed this country to sell their cargoes for higher prices in Europe.

U.S. Energy Department economists expect imports to increase in the next two years by 1.4 bcf daily as new production comes on line in Equatorial Guinea, Nigeria, Norway, and Qatar.

That still won't fill 30 bcf of daily capacity, and several of the terminals are likely to be mothballed before or during construction. Others could be lonely outposts for security guards watching the silent, empty docks of half-billion-dollar white elephants, at least for the next few years. ●

## EXPLORATION & PRODUCTION

## Nexen confident entering growth phase

Canadian independent Nexen is pushing ahead with plans to double the output from its Long Lake oil sands joint-venture with OPTI Canada confident that the project's advanced operating technology can cushion front-end cost inflation.

Chief Financial Officer Marvin Romanow said the capital budget for Phase 2 will be higher than Phase 1, which is scheduled to process its initial synthetic crude late this year and peak at 70,000 barrels per day.

He said Nexen expects to sanction Phase 2 soon after detailed engineering is completed in the first quarter of 2008 and discussions are already underway with engineering firms and contractors to continue expansion.

But he said Nexen has no intention of hazarding a guess at Phase 2 costs.

Houston-based Cambridge Energy Research Associates said in a February study that new oil and gas projects are facing 53 percent increases on a global scale for the cost of construction materials and to handle shortages of workers, vendors and equipment. Nexen Chief Executive Officer Charlie Fischer said Long Lake's steam-assisted gravity drainage technology provides a built in edge of C$10 per barrel over similar projects.

He also said that sequential development of the second phase will provide some synergies from first-phase operations.

—GARY PARK



## EXPLORATION & PRODUCTION

## Deep Panuke a 'keeper' for EnCana

Regardless of delays, shrinking reserve numbers and questions about future ownership, EnCana continues to stay the course with its Deep Panuke gas project.

Although focused almost exclusively on onshore resource plays and the oil sands, the big Canadian independent shows no signs of backing away from the offshore Nova Scotia venture.

Chief Executive Officer Randy Eresman told a Feb. 15 conference call that Deep Panuke is "a keeper for us. It will be a great addition to EnCana's overall portfolio."

### Regulatory hearings to start

Gerry Protti, president of EnCana's offshore and international division, said the immediate focus is on the March 5 start of regulatory hearings.

Otherwise, EnCana is seeking expressions of interest for some major components and is exploring its pipeline options.

Eresman conceded that the company's other activities off Canada's East Coast have not been all that successful and, for that reason, exploration has been cut back.

In a recent update of Deep Panuke reserves, estimates ranged from 392 billion to 892 billion cubic feet, with a mean 632 bcf, falling short of initial estimates of 1.1 trillion cubic feet. Based on those number, production is expected to peak at 300 million cubic feet per day, off 25 percent from original targets.

If regulatory approval is obtained, EnCana hopes to make a final decision this year on whether to proceed.

—GARY PARK

*continued from page 1*

# COSMO

### A sidetrack to a sidetrack at Hansen

Pioneer applied to renew its oil discharge prevention and contingency plan in January. The Alaska Department of Environmental Conservation declared the plan application sufficient for review and posted a public notice on Feb. 21 that said Pioneer proposed "to conduct a regional, multi-year onshore oil and gas exploration drilling program."

JUDY PATRICK

**KEN SHEFFIELD**

The actual spill plan addressed the current project in addendum A under project overview, saying the company planned to drill "two sidetracks" — 1A and L1 — a drilling program that would run from July 2007 to July 2008. Since Hansen No. 1A was drilled in 2003 as a sidetrack to the 2001-02 Hansen Well No. 1, Petroleum News' assumption is that there was a typo in the spill plan and that Sheffield's statement was correct when he said Pioneer plans just one sidetrack at this time — supposedly No. L1, a sidetrack to Hansen No. 1's sidetrack 1A.

Petroleum News sources say Pioneer is looking at drilling as many as 21 wells over a period of 3-5 years at Cosmopolitan, if the project proves commercially viable and is sanctioned by its working interest owners, which include Pioneer (50 percent), ConocoPhillips (20 percent), Devon Energy (17.5 percent) and Forest Oil (12.5 percent).

### No. 1A went out almost four miles

The first two Hansen wells were drilled by ConocoPhillips, which was the Cosmopolitan unit operator until 2006 when it sold 40 percent of its 60 percent interest to Pioneer.

Both the original well and the first sidetrack were drilled from an onshore pad in section 2, township 4 south, range 15 west, Seward Meridian, to bottomhole locations out under Cook Inlet in section 32-T3S-R15W, SM, west-northwest of the onshore pad. The drilling pad was on a bluff on private land overlooking the inlet, approximately six miles north of Anchor Point and one-half mile west of the Sterling Highway. Cosmopolitan is about two miles offshore.

*Petroleum News sources say transportation facilities for Cosmopolitan would likely include an oil pipeline to Nikiski and a natural gas pipeline tie-in to the Kenai-Kachemak Pipeline at Happy Valley.*

The same drilling pad will be used by Pioneer to drill the second sidetrack this summer, but the bottomhole location has not yet been released by the company, nor has a drilling rig selection been announced.

What is known is that the sidetrack will be drilled in much the same way as the first, using extended reach drilling technology, and that related activities, such as preparing the gravel pad and setting up the camp and rig, will begin in April or May. Production testing, Pioneer said, is expected "to occur over a period of several months," which was what was done at the first sidetrack.

During the testing of that first sidetrack ConocoPhillips trucked produced oil to the Kenai Peninsula's Tesoro refinery, a Forest executive said at the time.

DEC said Pioneer's spill plan proposes to address prevention and response measures for a response-planning standard of 1,500 barrels per day for 15 days to a total of 22,500 barrels at the drilling site.

### First production 2010

In a fall 2006 speech, Sheffield said that Pioneer would evaluate the results from that new well and, if the results met certain criteria, the company would define a development strategy and make a development decision.

"We're pushing this project forward," he said. "We're envisioning that if all goes well we could see first production in approximately 2010."

The 2010 startup date is contingent on further appraisal of the prospect, he said, noting that a development at Cosmopolitan would entail a large project.

"If all this were to come together … it would require some pretty significant infrastructure. … We're about 65 miles from the existing Tesoro refinery."

Petroleum News sources say transportation facilities for Cosmopolitan would likely include an oil pipeline to Nikiski and a natural gas pipeline tie-in to the Kenai-Kachemak Pipeline at Happy Valley.

### Challenges ahead

Petroleum News sources say producing Cosmopolitan from onshore will be challenging.

The Hansen No. 1 "well went down about a mile and a half and then out underneath the inlet about three miles" and was a "world-class accomplishment," Rick Mott, ConocoPhillips Alaska's vice president of exploration and land in April 2003 told an Anchorage audience when the Hansen No. 1A sidetrack was being drilled. State records show it at 18,630 feet total depth and 7,418 feet true vertical depth.

Mott said the sidetrack was being drilled with "the largest and most powerful drilling rig in Alaska" (Nabors Rig 273) and would go even farther out underneath the inlet (almost four miles). The sidetrack was finished a month later at a total depth of 20,789 feet. Its true vertical depth was 7,102 feet.

Former Alaska Division of Oil and Gas Director Ken Boyd told Petroleum News Feb. 21 that he recalled a discussion years ago about using a jack-up rig vs. onshore drilling at Cosmopolitan.

"I think the answer is it is simpler to drill the reservoir from a jack-up but not absolutely necessary. The problem, of course, it that a more substantial rig is needed to drill offset — long reach — wells from onshore. A jack-up might be required to reach the extreme western part of the structure," but that might not be a big deal with advances in technology, Boyd said.

"I will guess that the majority of the prospect can be reached from onshore, albeit with some difficulty and added expense," he said.

One of the problems Pioneer faces "is the nature of the rocks. Cook Inlet, unlike the North Slope, is full of gummy coal that wreaks havoc with directional wells," Boyd said.

"Phillips, when it was just Phillips, had real problems drilling directional wells in the Sunfish prospect. Coal was the problem, or one of the problems," he said referring to the abundance of coals under the inlet that have been known to collapse in around drill pipe causing it to get stuck and necessitating the drilling of a sidetrack.

"I don't think you have to use a jack-up but it would be desirable. Of course the downside is that there is no jack-up" in Cook Inlet right now, Boyd said.

In the third unit plan of exploration approved by Alaska's Division of Oil and Gas last fall and an extended suspension of operations granted by the U.S. Minerals Management Service, Pioneer was required to drill a new well or a sidetrack well to a minimum true vertical depth of 6,000 feet, with drilling to commence by Nov. 14, 2007. The well was to penetrate the Lower Tyonek sand-prone interval found in the Starichkof State No. 1 well.

### Geological information on record

The known oil accumulation at Cosmopolitan was discovered by Pennzoil in 1967 in the 12,112-foot vertical, Starichkof State No. 1, drilled from a jack-up rig. The company recovered 30 barrels of 20 degree API gravity oil from a drill stem test at about 6,900 feet and 21 barrels from a drill stem test at about 6,800 feet.

Pennzoil reported encountering the top of the Hemlock formation at 6,745 feet. A second well, also drilled in 1967, found some gas at 4,000 feet but water in the Hemlock formation at 7,355 feet some two miles from the first well.

While drilling results were enough to hold the lease, Pennzoil's discovery was never developed and the original unit lapsed.

In 2001, prior to drilling Hansen No. 1, Phillips said it had done some chemical analysis of the Starichkof oil and believed that new drilling would show actual gravity was significantly higher.

The Cosmopolitan operators have been relatively close mouthed about Hansen drilling results, but last fall Sheffield said the Hansen No. 1A entered the Hemlock and tested at approximately 500 barrels per day.

In mid-2005 Tim Dove, Pioneer's president and chief operating officer at the time, said the Hansen well and sidetrack "tested at a stabilized rate of 600 to 800 barrels a day over different intervals that lasted for three to four months."

Robert Boswell, former president and CEO of Forest, told an investment symposium in April 2002 that the Hansen No. 1 tested oil in the Hemlock and in the Tyonek formations.

Forest later said the Hansen No. 1A was completed with a horizontal section through the Starichkof and Hemlock intervals.

At the North American Prospects Exposition held Feb. 5-6, 2004, in Houston, Texas, ConocoPhillips was shopping for partners to share some of the cost of exploring Cosmopolitan, including shooting 3D seismic over the prospect, which was eventually done in 2005.

In literature it handed out at NAPE, ConocoPhillips described the original oil in place at Cosmopolitan as "significant in the combined section of the Lower Tyonek and Hemlock sandstones. These units have been tested and are shown to flow 25 degree API gravity oil at rates greater than 500 BOPD." The company also said that there was upside potential "for increased well production rates with better reservoir understanding," as well as shallow gas and oil potential in thin sandstones in the Upper Tyonek formation.

The oil play, ConocoPhillips said, is in fluvial sandstones in the Oligocene Hemlock and Miocene Tyonek formations of the Lower Cook Inlet basin. An axial fluvial braid plain is the depositional environment for these sections. Net pay of more than 100 feet in the Hemlock sandstone, the primary target and more than 130 feet in the secondary target, the Miocene Tyonek are within the general reservoir parameters.

ConocoPhillips described the play as a four-way dip closure. ●

## INTERNATIONAL

# Exxon, Qatar scrap GTL project

Exxon Mobil Corp. and Qatar Petroleum said Feb. 20 they would scrap a gas-to-liquids project in favor of developing another project to provide natural gas to the domestic Qatari market.

The domestic project, Barzan, will supply domestic gas to the booming Qatari economy, according to ExxonMobil's web site. Qatar has seen unprecedented industrial growth amid a natural gas boom.

The move comes amid soaring costs for major capital projects like converting gas to petroleum liquids. The liquids are easier to export by tanker ship than the gas.

Irving-based ExxonMobil and Qatar signed an agreement for the GTL project in July 2004. The deal was due to expire later this year, said ExxonMobil spokeswoman Jeanne Miller.

"This is a decision we made that's very consistent with our investment approach," Miller said.

"The Barzan project is a very important strategic project for Qatar," said Qatar Energy Minister H.E. Abdullah bin Hamad Al-Attiyah.

**—THE ASSOCIATED PRESS**

● GOVERNMENT

# It's catch-up time in Alberta

*Action needed if energy-based economy to remain source of prosperity; technology could create energy superpower*

**By GARY PARK**

*For Petroleum News*

The Alberta cash cow is drying up after decades of accounting for 40 percent of total investment in the province, posing a challenge for the government to do what it has long neglected — start figuring out how to convert its energy resources into sustained, long-term prosperity.

More than at any stage in its recent history, Alberta is at a crossroads and must take urgent steps to deal with its future risks and opportunities, say two University of Calgary researchers.

The paper, by Robert Mansell, managing director of the university's Institute for Sustainable Energy, Environment and Economy, and research associate Ron Schlenker, warns that energy royalties collected by the government could fall by as much as 50 percent by 2013.

The underlying reason is tied to the conventional oil and gas sector, which Mansell said has peaked after 15 years as the major driving force in Alberta's growth and has accounted for two-thirds of the royalties paid to the government.

If commodity prices stay in the range of C$4-$5 per thousand cubic feet for gas and US$40 per barrel oil that would be enough to see the province's non-renewable resource revenues cut in half to C$5 billion.

The report said that from 1971 to 2004, the petroleum industry contributed C$1.5 trillion to Alberta's Gross Domestic Product, at an average of C$45 billion a year.

The industry also contributed C$280 billion in government revenues, C$600 billion in labor income and 12 million person-years of employment, at an annual average of 375,000 person-years.

Removing oil and gas revenues from the question, the Alberta GDP over the same period would have been 42 percent smaller.

Although non-renewable resource revenues are projected to fall sharply over the 2005-2013 period, the industry's average annual contribution to GDP is forecast to be about C$87 billion, or 40 percent of overall provincial GDP compared to the historic 42 percent.

But the report said there is no doubt the oil and gas industry will be the main engine of Alberta's economic growth and prosperity for many decades because, in both size and impact, it is "difficult to imagine the possibility of another sector with the prerequisite comparative advantage and size to significantly replace energy as the key driver of the economy."

However, the researchers emphasize that there are major hurdles to clear if Alberta is to extend its prosperity.

That will require longer-term social and physical infrastructure planning and funding commitments — such as copying the investments and commitments in the 1980s that led to the development of in-situ technology which will support 90 percent of future bitumen extraction in the oil sands.

But Mansell suggests that work should have started 15 years ago to deal with the water consumption and greenhouse gas emissions problems that represent a risk to oil sands expansion.

To achieve the goal of long-term prosperity, the challenges include overcoming: Labor and skills shortages, rising costs, access to resources and landscape impacts, lack of infrastructure, managing water use and greenhouse gas emissions, the authors said.

They recommended that the Alberta government should adopt a longer-term strategy that incorporates more of an "asset and risk management" framework for energy and environmental policy and regulation.

That framework would place greater emphasis on preserving, developing and preparing for future options and on minimizing the likelihood of irreversible or very damaging outcomes.

On the upside, the researchers said there is no shortage of opportunities for energy-based sustainable growth and prosperity, given the expected growth in energy demand.

"With its huge concentration of energy resources, there is the potential (for Alberta) to become a leader in clean, competitive and secure energy.

"The one thing we can be certain about is that meeting the challenges and unlocking the opportunities will require a clear vision and long-term commitments to that vision.

"It will require major, sustained investments in the development of people, infrastructure, technologies and policies focused on cleaner and more efficient ways of recovering, using and upgrading our large fossil fuel base, systematic integration of energy and environmental systems and, in general, a shift in policy and regulatory frameworks to better embody asset and risk management strategies appropriate in an environment of risk and uncertainty."

Although the oil sands are grabbing most of the attention in terms of Alberta's future energy potential, the study said conventional oil and gas should not be overlooked.

With long-term commitment to research, development and deployment of new technologies, conventional recovery rates could be raised to 41 percent from 27 percent for oil and to 72 percent from 59 percent for gas.

At those levels, an additional 8.4 billion barrels of oil could be recovered generating more than C$30 billion in royalties and C$550 billion in GDP, while the increased gas recovery would translate into an additional 32.5 trillion cubic feet, adding C$16 billion to royalties and C$250 billion to GDP.

With most of the physical infrastructure already in place, "very little additional public expenditure" would be needed, the study said.

Success in converting "even a modest portion of the ultimate potential into clean, secure and competitive energy supplies translates into a huge prize," the authors said.

"Given the size and location of this resource base, it would seem that energy represents one of the clearest and most significant examples of comparative advantage for Alberta and Canada in an increasingly competitive global economy," they said. "Put simply we have the potential to become an energy superpower in a world with an ever-growing appetite for energy." ●

## OIL COMPANY EARNINGS

### Earnings from Petroleum News Top 25

*Earnings fourth quarter 2006 • Change from fourth quarter 2005*
*Liquids production fourth quarter 2006 • Change from fourth quarter 2005*
*Natural gas production fourth quarter 2006 • Change from fourth quarter 2005*

| Company | symbol | earnings | % | liquids | % | gas | % |
|---|---|---|---|---|---|---|---|
| **ExxonMobil** | XOM | $10,250 | -4 | 2,678,000 | +2 | 9,301 | -5 |
| **BP** | BP | $2,880 | -22 | 2,416,000 | –6 | 8,256 | -2 |
| **RD/Shell** | RDS-A | $5,283 | +21 | 2,201,000 | +11 | 8,377 | -5 |
| **Chevron** | CVX | $3,772 | -9 | 1,812,000 | +6 | 4,849 | -2 |
| **ConocoPhillips** | COP | $3,197 | -13 | 1,148,000 | +13 | 5,394 | +55 |
| **Occidental** | OXY | $928 | -19 | 471,000 | +15 | 735 | +9 |
| **EnCana** | ECA | $663 | -72 | 152,154 | -34 | 3,406 | +2 |
| **Can. Natural** | CNQ.TO | | | | | | |
| **Anadarko** | APC | $1,916 | +119 | 243,000 | +55 | 2,226 | +100 |
| **Devon** | DVN | $582 | -40 | 231,200 | +8 | 2,287 | +6 |
| **Marathon** | MRO | $1,079 | -15 | 212,000 | +12 | 874 | -13 |
| **Husky** | HSE.TO | $542 | -19 | 265,700 | +23 | 662 | -2 |
| **Talisman** | TLM | | | | | | |
| **Apache** | APA | $519 | -34 | 246,192 | +8 | 1,721 | +39 |
| **Imperial** | IMO | C$794 | -22 | 267,000 | -0- | 529 | -9 |
| **Suncor** | SU.TO | C$358 | -47 | 260,000 | +52 | 191 | +1 |
| **Petro-Canada** | PCZ | C$384 | -42 | 245,000 | -16 | 739 | -8 |
| **Nexen** | NXY.TO | C$77 | -75 | 166,100 | -11 | 243 | +4 |
| **XTO** | XTO | $429 | -5 | 58,362 | +11 | 1,230 | +12 |
| **Chesapeake** | CHK | | | | | | |
| **Pioneer** | PXD | $28 | -79 | 43,712 | -16 | 343 | +10 |
| **EOG** | EOG | $237 | -49 | 28,700 | -0- | 1,407 | +7 |
| **Newfield** | NFX | $82 | -81 | 17,800 | +23 | 613 | +40 |
| **Pogo** | PPP | -$17 | —- | 35,647 | -0- | 292 | +10 |
| **Swift** | SFY | $35 | +2 | 23,900 | -2 | 63 | +3 |

** Does not include share of Lukoil production*
***Millions of cubic feet equivalent*
*Liquids production in barrels per day. Natural gas production in millions of cubic feet per day.*

*NOTE: Top 25 is based on Petroleum News research*

# Companies involved in Alaska and northern Canada's oil and gas industry



*All of the companies listed above advertise on a regular basis with Petroleum News*

Petroleum news

## Business Spotlight

FORREST CRANE

**Bernie Leas**, Operations Manager

### Horizon Well Logging Inc.

Horizon Well Logging, located in Anchorage, provides formation evaluation, drilling parameter, pressure detection and rig monitoring services on oil, gas and geothermal wells. The company also provides geological consultants and wellsite geology services to its clients. Horizon conducts business in the Western United States, Alaska, and Central and South America.

Bernie Leas joined Horizon in 2004, bringing many years' experience with such firms as Epoch Well Services, Sperry Sun and Exlog (now Baker Hughes Inteq). Another field of interest is gold and silver mining, which he's done in Canada and California. He and wife Barbara are fortunate to have their three grown children, Deborah, Bernie and Bettina, six grandchildren and a great grandchild all living in Alaska.

*continued from page 1*

# SHELL

"Our company has a proud legacy here," Fox said, referring to Shell's history of exploration in the state. Shell left Alaska in 1998 after more than 40 years of activity in the state that included exploration in the Beaufort Sea, the Chukchi Sea, the Bering Sea, and the discovery of the Beaufort Sea's Northstar and Liberty fields.

"We drilled four out of the five wells that have been drilled in the Chukchi and participated in most of the wells that were drilled in the offshore Beaufort," Fox said.

Fox himself was involved in Shell exploration activities in the Bering, Beaufort and Chukchi seas in the 1980s.

Now, high oil prices and the availability of new oil and gas technologies have attracted Shell back to the Alaska offshore regions, Fox said.

## Two fronts

Fox characterized Shell's current Alaska initiatives as pursuing two fronts — investigations that focus on finding new prospects, including the preparations for future lease sales, and work associated with known prospects. Work on the first of those fronts involves the acquisition of 3-D seismic data, while work on the second front primarily involves exploration drilling and drilling preparations.

Shell hopes to acquire 3-D seismic from both the Chukchi and Beaufort Seas in 2007, depending on sea ice conditions, Fox said. And, according to Shell's Alaska Coastal Management Program filing WesternGeco's M.V. Gilavar will conduct the seismic surveys, probably between early August and late October. In the summer of 2006 the same vessel acquired some Chukchi seismic for Shell, but the vessel could not operate in the Beaufort Sea in that year because of severe ice conditions.

As with last year, the Chukchi surveys will take place 55 to 60 miles, or more, offshore, Fox said. Shell will work with the Alaska Eskimo Whaling Commission to adaptively adjust the seismic program, rather than applying an over prescriptive set of operational rules. That presents the best way to minimize any impact on subsistence hunting, Fox said.

"We will work with them adaptively to fit our seismic program into a schedule that does not affect the hunt," Fox said.

And Fox commented that the 2006 Chukchi seismic program had not impacted the hunt, although three different companies were all acquiring seismic.

"When we went back for the post-season reviews, the villagers on the Chukchi Sea declined … because they saw no impact," Fox said.

Shell is also conducting a research program to test the feasibility of acquiring seismic data from winter sea ice rather than during the summer open water season (see the Jan. 21 edition of Petroleum News).

## Drilling at Sivulliq

On the other exploration front, the investigation of known prospects, Shell is focusing initially on the area of the Sivulliq prospect. Formerly known as Hammerhead, Sivulliq lies due north of Flaxman Island on the western side of Camden Bay. The prospect contains a known oil pool penetrated by two exploration wells drilled by Unocal in 1985 and 1986. According to information published by MMS the prospect is estimated to contain 100 million to 200 million barrels of technically recoverable oil in a Brookian sand reservoir. But the oil pool has not been fully delineated.

Interestingly, Shell participated in the original Hammerhead drilling and Fox was himself onboard the drill ship that tested the Hammerhead oil discovery.

Shell's current plan involves the use of modern technology to appraise the known oil accumulation.

"You want to verify with today's technology what's there," Fox said. "You want to hinge your future on some strong possibilities early on."

Shell expects to drill three wells at Sivulliq during the 2007 open water season, as part of a program that anticipates the drilling of three to four wells per year during the period of the company's 2007 to 2009 eastern Beaufort Sea exploration plan.

And the drilling plans include one deep target with a well depth approaching 14,000 feet, although the majority of currently planned wells will likely drill to depths of less than 8,000 feet, Fox said.

But Shell's choice of specific wells to drill after 2007 will depend on the results of the 2007 work.

"What we do after year one depends a lot more on (what happens in) year one than anything else," Fox said.

However, the need for a large petroleum find to justify the huge cost of arctic offshore petroleum exploration and development attests to Shell's confidence in the region.

"Frankly if we didn't believe there was a possibility of that (significant find) we wouldn't be in with this big

*see* **SHELL** *page 18*

*continued from page 1*

# ANWR

millions of barrels of oil stashed in salt caverns in Texas and Louisiana.

Luft is executive director of the Institute for the Analysis of Global Security, a Washington, D.C.-based energy security think tank.

He noted that the Gulf Coast is vulnerable to hurricanes and urged Bush to establish additional caches of oil in other parts of the country.

"The administration should consider a radically different and much cheaper approach to boosting our security: make ANWR our strategic reserve. For many years, supporters of drilling in the Arctic National Wildlife Refuge have failed to open it for production. With the Democrats controlling Congress, the chances of drilling are slimmer than ever. President Bush didn't even bother to raise the issue last month. But reframing the issue to cast the refuge as an emergency stockpile rather than a source of production might well change the politics," Luft wrote.

Alaska senior Sen. Ted Stevens told Alaska reporters Feb. 20 that he, coincidentally, had been considering the same idea and would like to press for its consideration in Congress.

## Idea greeted with consternation

Other Alaskans greeted the notion with consternation.

"I still don't know or understand what Sen. Stevens is proposing," said longtime ANWR lobbyist Roger Herrera. "The whole purpose of the SPR is to have a reserve of certain oil that is available instantly. At the moment ANWR oil is neither certain nor quickly available.

"If the idea is to prove the area up and then shut it in, that's fine, except who will pay for everything? The federal government? How does Alaska get its 50 percent share? And so on and so forth. I simply do not understand enough to comment," Herrera added.

"Furthermore, I have a hard time coming up with a concept that might work. However, I would prefer to reserve judgment."

Former Alaska oil and gas director Ken Boyd also raised concerns.

"I may have testified against this idea in Congress once," Boyd said. "ANWR is not an oil bank. We don't know what's there.

"The part of this idea that I don't like is, 'how do you do it?' You can't ask a capitalist company to spend the money to explore for and develop oil in ANWR and then just shut in the wells," Boyd said.

Not only would maintaining an oil reservoir in ANWR be "fantastically expensive" and extremely difficult for government agencies to do, it also would be highly impractical and dangerous, Boyd said.

"The oil would still be in the ground, in the rock as nature put it there 100 million years ago. It's not like the oil is in a jar," he observed.

Moreover, the SPR is designed to allow the president to respond quickly to a national emergency. ANWR oil could not be produced, processed and shipped to refineries on the West Coast fast enough to make a difference quickly in a volatile oil market, he said.

The only way the idea could possibly work, according to Boyd, is if ANWR's 1002 Area was explored and developed in the normal fashion and then the U.S. government bought the oil when it reached the West Coast or some other designated U.S. market. ●

*continued from page 17*

## SHELL

investment," Fox said.

### Two drilling vessels

Shell will be using two drilling vessels, the Kulluk and the Frontier Discoverer, for the Beaufort Sea drilling program.

The Kulluk was originally designed to operate specifically in Beaufort Sea ice conditions, Fox said. And Shell has had the Discoverer completely refurbished for the Beaufort Sea operations, he said. One important feature of the Discoverer is an anchor system that allows the vessel to weathervane around its center, without the need to move anchors, Fox said.

The use of two drilling vessels will enable Shell to obtain early evaluations of oil and gas prospects and will also enable one vessel to back up the other.

Fox pointed out that it is essential to use mobile drilling platforms in the water depths of more that 100 feet where Shell will be operating and that Shell has a protocol for removing the rigs from the drilling area in severe ice conditions.

A fleet of ice-rated vessels will support the drilling operations. But, because of the lack of an icebreaker fleet in the United States or Canada, the vessels are coming from several countries, including Russia and Finland. For example, the icebreaker Vladimir Ignatyuk will come from Russia.

Shell has commissioned and equipped a brand new U.S. 301-foot, ice-rated, anchor handling supply vessel as an oil spill response vessel. And the company is bringing on site a complete suite of offshore oil spill response equipment — ASRC RTS will manage the offshore oil spill response arrangements and has prepared Shell's oil discharge prevention and contingency plan. Alaska Clean Seas will provide nearshore oil spill response support.

Although he hopes that an oil spill will never happen, Fox is confident that the technology and equipment that Shell has available will enable an effective cleanup in the event of any size of spill. If there were a spill "we'll be there until it's cleaned," he said.

In parallel with the drilling activities, Shell is continuing with some other Beaufort Sea investigations that it started in 2006. An approximately 12-day program of geotechnical borings will determine the properties of the top 400 feet of soil under the sea floor. This scientific investigation forms an essential precursor to any petroleum development evaluation — preliminary engineering design and cost estimates for any development depend on data about the subsea soil.

And sea bottom surveys at potential future drilling sites will involve the use of a type of low-power seismic system that can identify drilling hazards such as shipwrecks or shallow gas pockets.

"We proactively work ahead of time on potential sites and go get those surveys," Fox said.

### Wildlife monitoring

During the 2007 open water season Shell will be mounting a major program to monitor marine mammals and mitigate any impacts of the industrial activities. Of particular concern is the potential for impacts on the migration routes of bowhead whales and the consequent impact on subsistence hunting.

"We have worked this with the Alaska Eskimo Whaling Commission and the North Slope Borough wildlife department," Fox said. "From all our conversations they are both very pleased with Shell's comprehensive approach to gathering data on the actual routes that the whales take."

*Shell will deploy five passive acoustic arrays out in the Beaufort Sea, at intervals along the coast from near Point Barrow in the west to the Kaktovik in the east. Each array will extend about 20 miles out into the sea. The arrays will enable the continuous monitoring of whale movements during the open water season, by tracking whale sounds.*

Marine mammal observers recruited on the North Slope will be stationed on every Shell vessel, watching for wildlife 24 hours per day, seven days per week. Shell has hired about 70 observers, Fox said.

Shell will deploy five passive acoustic arrays out in the Beaufort Sea, at intervals along the coast from near Point Barrow in the west to the Kaktovik in the east. Each array will extend about 20 miles out into the sea. The arrays will enable the continuous monitoring of whale movements during the open water season, by tracking whale sounds.

Aerial monitoring flights will patrol out from the coastline twice a day during daylight hours. Shell also plans to test the use of unmanned aerial vehicles for wildlife monitoring, although the company has not yet reached the point of replacing manned flights by unmanned flights.

"We are working on a program to do further testing this season," Fox said. "We are very hopeful about that but we are not ready to replace the others yet."

Shell has conducted some tests of wildlife spotting from drones in the Puget Sound, in the Pacific Northwest.

"There were a lot of things learned and it was a very encouraging result," Fox said.

### Community involvement

As in 2006, Shell is taking a lead in developing a single 2007 whaling conflict avoidance agreement that would apply to all offshore industrial activity, Fox said. In 2006, Shell contacted every possible offshore operator to ensure comprehensive involvement in the agreement.

"In return visits to the villages we got very positive remarks about the way we operated last year and we were invited to do it again," Fox said.

And a key component in communication with village subsistence hunters will be a Shell-operated communications center in every village, fully manned by village residents. Protocols require every vessel to call the centers at least every six hours.

"The Alaska Eskimo Whaling Commission and Shell and various other parties during the season will be talking every day," Fox said. "… We're committed

*see* **SHELL** *page 19*

*continued from page 1*

## PLAN

Shell's drilling-related activities in the Beaufort Sea. On Feb. 6 MMS issued a separate permit for Shell's proposed 2007 3-D seismic operations in the Beaufort Sea; the agency is still reviewing a Shell permit application for acquiring 3-D seismic in the Chukchi Sea.

All of the MMS approvals are subject to conditions that must be met before the planned operations can be carried out. In particular, the offshore activities require incidental harassment authorizations from the National Marine Fisheries Service; a conflict avoidance agreement with the Alaska Eskimo Whaling Commission and the North Slope village whaling captains associations; and a bowhead whale monitoring program. The lighting configuration on drill ships must be configured to minimize the attraction of birds to the structures. And Shell must verify the absence of historic shipwrecks at the Sivulliq site where the company plans to drill in 2007.

Drilling of any Beaufort Sea well will also require an MMS drilling permit.

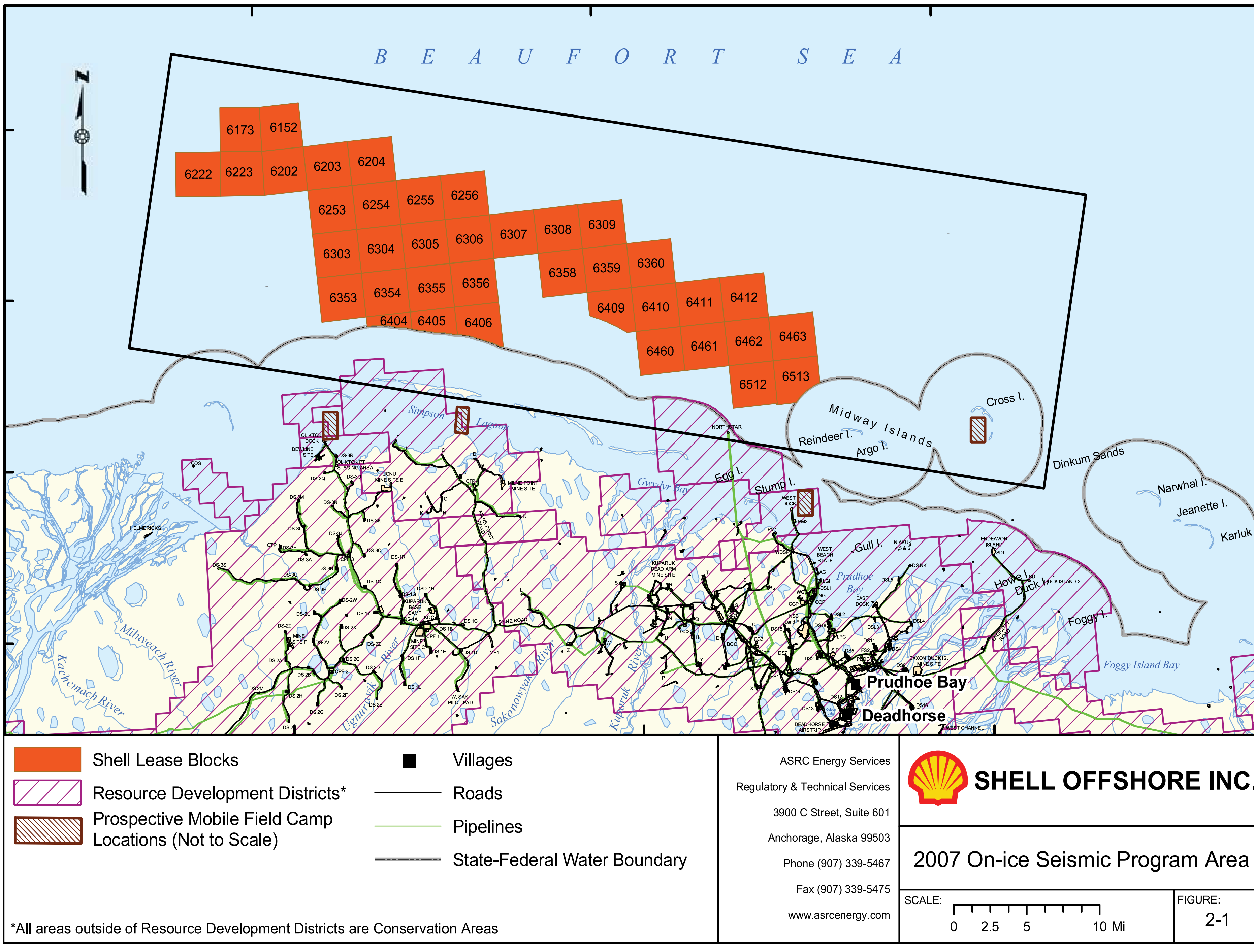
*Drilling of any Beaufort Sea well will also require an MMS drilling permit.*

Approval of the oil discharge prevention and contingency plan is contingent on 22 conditions being met, including the need for clarification of some of the communications arrangements and the clarification of some response procedures. MMS will also require Shell to conduct equipment deployment exercises and a tabletop exercise to demonstrate the viability of the plan.

On Feb. 16 the 50-day review period for the Alaska Coastal Management Program review for Shell's Beaufort Sea drilling program began. In its ACMP filing Shell identified 12 possible locations for geophysical surveys, exploration and appraisal drilling — seven locations with Flaxman Island names on blocks 6658, 6707, 6708, 6709, 6765, 6824, and 6874; four locations with the name Barter Island on blocks 6801, 6802, 6962, and 7117; and one location with the name Harrison Bay on block 6222. The project description in the public notice said a total of 16 vessels would be operating in the Beaufort in connection with the drilling program in 2007.

Deadline for written comments under the ACMP review is 5 p.m. on March 19.

**—ALAN BAILEY**




*continued from page 18*

## SHELL

to good communications and constant dialogue with the people representing the whaling captains and with the agencies. … We'll be adjusting and adapting all the time. … If communications are there you can work through a lot."

Going beyond the subsistence hunting issue, Shell sees safety and the protection of the environment, coupled with community involvement, as critical components of its Alaska operations.

And community involvement goes way beyond having people say "okay" to what Shell is doing. It means having local people fully involved in Shell's operations, Fox said. Fox described a vision of life in a village home in which "there will be someone sitting at the (dining) table who is involved in our business, telling the truth about what is happening and making their family proud of what they're accomplishing."

"We believe that's essential," Fox said.

Shell wants Alaska to become a heartland for its operations.

"At this point there's a lot of road ahead for us. … We're interested in the long term — long term exploration and development in Alaska. Everything we do is based on a belief that this will be a heartland for Shell," Fox said. "… Trust is going to be the foundation from which we can build our heartland business in Alaska."

And what are Fox's feelings about his return to Alaska?

"I've always loved Alaska and I'm very happy to be back. Part of the reason I accepted this job is because I believe it's a special place," Fox said. ●



*continued from page 1*

## INSIDER

approved Feb. 14. Percentages vary but in each case 100 percent of Anadarko's interest was bought out by Eni.

Sources also said that Milan, Eni headquarters, has approved development of Nikaitchuq. PN sources said this sale was not any indication Anadarko was pulling out of Alaska.

Recent production tests at Nikaitchuq reportedly yielded more than 2,000 barrels of oil per day at 19.2 percent gravity.

Nikaitchuq was one of the prospects identified by Armstrong Alaska, which brought Kerr-McGee to Alaska as a majority partner in late 2004 in Nikaitchuq (and Tuvaaq) to explore the acreage. Last year Anadarko bought out Kerr-McGee, and Armstrong sold its North Slope interests to Eni in mid-2005.

Kerr-McGee said in 2006 that Nikaitchuq's gross estimated resource range was 100 million to 200 million barrels of oil equivalent. The company said Nikaitchuq facilities would be built to handle a flow of 60,000 barrels per day.

Mega-major Eni is drilling its first exploration wells in Alaska this winter.

**—KAY CASHMAN**

## Canada told to forget Arctic claims

**A PENTAGON OFFICIAL DESCRIBED** some of Canada's claims to Arctic sovereignty as "excessive" and suggested working through the United Nations to protect security and the environment would be a better route.

James Kraska, oceans policy advisor to the U.S. Joint Chiefs of Staff, said in an article that the Law of the Sea does not support Canada's assertion that it has jurisdiction over the Northwest Passage.

He said working through the International maritime Organization would enable Canada to achieve its most important policy goals for the passage and gain widespread compliance with Canadian regulations for "enhanced safety, security and environmental protection."

A copy of the article, published by the Ottawa Citizen, said the European Union endorses the U.S. view that Canada does not have sovereignty over the Northwest Passage.

He predicted, despite a hard-line stance by Prime Minister Stephen Harper and other Canadian politicians, that the issue is "unlikely to cause significant friction" between Ottawa and Washington because both countries are partners in NATO and share a mutual respect for the rule of law.

*However, the Harper government restated Canada's long-held claim to the Northwest Passage, making that a key element of its election campaign a year ago, and has pledged to buy icebreakers to patrol the Arctic and to establish deepwater ports in the north.*

However, the Harper government restated Canada's long-held claim to the Northwest Passage, making that a key element of its election campaign a year ago, and has pledged to buy icebreakers to patrol the Arctic and to establish deepwater ports in the north.

As one example of how the issue could be resolved, Kraska said Malaysia, Singapore and Indonesia agreed in 2005 along with 31 other countries to settle a 20-year dispute over the Strait of Malacca through a "multilateral" approach, working through the International Maritime Organization.

**—GARY PARK**

## Alberta calm and in control

**WE HAVE NOTHING TO FEAR**, but ... that didn't stop a wave of jitters spreading across Canada when an al-Qaeda Internet posting called for terrorist strikes against "petroleum interests in all areas which supply the United States," including Canada, Mexico and Venezuela.

The message was distributed internally within the al-Qaeda Organization in the Arabian Peninsula, an arm of Osama bin Laden's network, and was intercepted by the SITE Institute, a non-profit US group that tracks terrorist websites.

It had radio stations foaming at the mouth and produced a headline across the Calgary Herald's front page: "Oilpatch on alert over terror threat."

The posting also caused the Alberta Counter-Terrorism Management Plan, an office in the Solicitor-General's Department, and the Alberta Energy and Utilities Board to put the petroleum industry on "heightened alert."

But the authorities also refrained from raising Alberta's threat level from "low," where it has been since the scale — which ranges from no threat, to low, medium, high and imminent — was introduced after Sept. 11, 2001.

AEUB spokesman Darin Barter told Petroleum News that the assessment did not warrant action beyond "reinforcing the need to be vigilant," noting that the posted threat did not meet any of the specific criteria needed to elevate the threat level.

He said warnings targeting the Canadian oil and gas industry occur "intermittently" and are "neither on the increase nor the decrease."

Barter said emergency plans have been audited by the AEUB and all companies are "in compliance" with the regulator's requirements.

David Sands, in the office of Premier Ed Stelmach, said "no alarm bells are going off here. We are fully confident in the information we have."

Stelmach, in office less than three months, reacted calmly, doubting that bin Laden "even knows where I am."

However, he said the Alberta infrastructure was a critical concern and that's what the government would be protecting. However, one industry veteran observed that, other than taking sensible precautions to tighten security, Alberta remained as vulnerable to terrorists as any part of the world.

"If someone decided to drop a bomb from a small plane over the Edmonton refinery district there's nothing anyone could do," he said.

Kinder Morgan Canada Vice President of Operations Hugh Harden echoed that thought, saying it was "difficult to take action as there is no specific threat."

Others contended that the fact information was being shared among producers and pipeline companies was at least proof that security programs were working.

Martin Rudner, director of Carleton University's Canadian Center of Intelligence and Security Studies, described the al-Qaeda posting as "very serious," given al-Qaeda's attack a year ago on the world's largest oil processing facility at Abqaiq in Saudi Arabia.

He said a successful attack against Canadian oil and gas supplies and the disruption to North American markets would be of both economic and symbolic significance to al-Qaeda.

**—GARY PARK**

NORTH OF 60
# MINING NEWS



THE ORCA QUARRY ON VANCOUVER ISLAND, PART-OWNED BY THE 'NAMGIS FIRST NATION, IS ABOUT TO START PRODUCTION
PHOTO COURTESY OF POLARIS MINERALS

*A special supplement to Petroleum News*
WEEK OF
February 25, 2007
Petroleum news

● BRITISH COLUMBIA

# Imperial prevails in bid for BcMetals

*Sister company of Northern Dynasty bows out after target's management cuts deal with rival, endorses opponent's buyout offer*

By ROSE RAGSDALE

*For Mining News*

From the opening volley last fall in what became a heated bidding war between two Canadian junior mining companies seeking to acquire BcMetals Corp. of Vancouver, B.C., observers couldn't predict what would happen next.

But Imperial Metals Corp., also of Vancouver, upped its buyout offer one last time Feb. 2 to C$1.70 a share, valuing BcMetals at just under C$70 million.

It proved to be an offer too good to refuse.

BcMetals urged shareholders Feb. 14 to tender their securities to the Imperial offer and indicated that BcMetals directors and managers planned to do the same.

Imperial's bid also persuaded Taseko Mines, Ltd., a subsidiary of Hunter Dickinson Ltd., to throw in the towel on its unsuccessful pursuit of BcMetals.

Taseko bowed out after weighing in with a final bid of C$1.60 a share Feb. 1 and picking up more than 3.2 million shares of BcMetals' nearly 41 million outstanding shares.

Taseko owns the Gibraltar copper-molybdenum mine, the Prosperity gold-copper project and the Harmony gold deposit, all in British Columbia. It is a sister company of Northern Dynasty Ltd., which is developing the Pebble copper-gold-molybdenum project in southwestern Alaska.

Imperial Metals holds the Mount Polley mine northeast of Williams Lake, B.C., and a 50 percent stake in the Huckleberry mine in west-central B.C.

Taseko indicated that it would liquidate its holdings in BcMetals, according to a statement Feb. 13.

### BcMetals fought takeover

The latest moves culminated months of back-and-forth bidding by the two companies, which drove up the original offer price of 95 cents a share Canadian for BcMetals stock to nearly double that amount.

By Oct. 5, Imperial has purchased 1.85 million shares of BcMetals securities at an average price of 94 cents a share Canadian, bringing to just over 3 million shares its total stake in the company.

To ward off the hostile takeover, BcMetals adopted a shareholder rights plan, or "poison pill," Oct. 20 that precluded a company from acquiring more than 20 percent of BcMetals stock. The junior also signed an agreement with a Hong Kong-based investment company to enter a limited partnership to develop its Red Chris property in northern British Columbia.

Red Chris, a rich porphyry copper-gold project in northern British Columbia, is widely regarded as the plum both Imperial and Taseko hoped to pluck with the acquisition of BcMetals.

Imperial Metals Chief Financial Officer Andre Deepwell told reporters in January that there aren't many projects like Red Chris available for development.

He said the project represents near-term production for Imperial within the next five years.

Taseko made its first bid for BcMetals of C$1.05 a share Nov. 2.

But when BcMetals announced its poison pill and limited partnership plans for Red Chris, both Imperial and Taseko reconsidered their purchase offers.

Bidding heated up again in early January when BcMetals management approved an Imperial offer of C$1.10 a share after that company dropped certain conditions attached to its bid and agreed to fund a $3 million line of credit for BcMetals.

Taseko immediately fired back with a purchase offer of C$1.15 a share, minus conditions it has previously attached to its bids.

A tit-for-tat series of offers and counter offers followed in which the bids shot up to the Imperial offer of C$1.70 a share Feb. 2. ●

## Correction

In our Dec. 24 issue, in a story titled "Kemess North expansion draws protests," we said that Northgate Minerals is managed by Hunter Dickinson. Northgate is not managed by Hunter Dickinson.

## ALASKA

### Nixon Fork mine ships first gold doré

Alaska's newest mine, Nixon Fork, produced its first gold doré in January. The doré is being shipped via Fairbanks to Xstrata's Horne smelter in Rouyn-Noranda, Quebec. Mechanical delays which were encountered during the commissioning process have been overcome and the gold mill is now operating at a capacity of 150 tons per day, Ontario-based St. Andrew Resources said in a release Jan. 25.

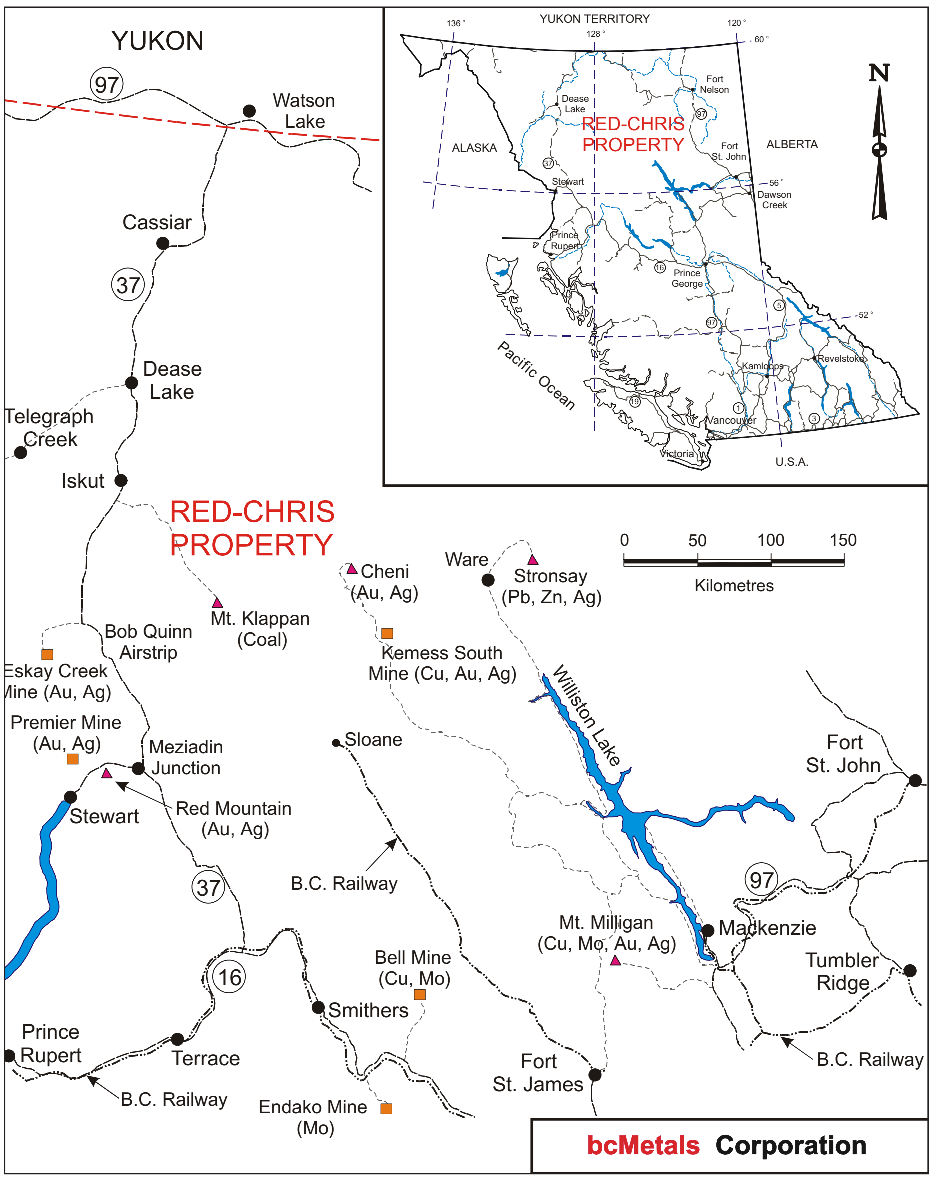
The next phase of the upgrade of the metallurgical circuit is under way, with the commencement of the installation of a cyanide leach circuit that will increase the percentage recovery of gold and also extract and re-treat the tailings from the previous operation at Nixon Fork. Re-treatment of tailings is expected to begin this summer. The company anticipates that Nixon Fork will produce 40,000 ounces of gold in 2007.

—SARAH HURST

PHOTOS COURTESY MYSTERY CREEK RESOURCES

**Above, refiners pour the second gold bar produced at Nixon Fork, which is owned by Mystery Creek Resources, a subsidiary of St. Andrew Goldfields.**

**At left, assayer Bob Baker holds the first gold bar produced at Nixon Fork mine near McGrath.**




● BRITISH COLUMBIA

# B.C. to extend power to Red Chris vicinity

**By ROSE RAGSDALE**
*For Mining News*

BcMetals Corp.'s plans to develop its potentially lucrative Red Chris copper-gold project in northern British Columbia may be moot now that Imperials Metals Corp. is the apparent winner of a recent bidding war for the Vancouver, B.C.-based mining company.

But the ambitious junior's plans got a big boost in January when British Columbia Transmission Corp., the crown corporation responsible for the province's power transmission lines, said it will move ahead with construction of a proposed extension of its Northwest Transmission Line to the vicinity of the Red Chris deposit.

Located 280 miles north of Smithers, B.C., and 11 miles southeast of the village of Iskut, Red Chris was to be developed as an open pit mine employing about 250 people full-time during operations. The capital cost of building the mine was estimated at C$200 million and annual spending on operations would total about C$70 million.

The mine plan called for processing 27,500 metric tons of ore per day over a projected mine life of 18 years, according to documents filed with the B.C. government.

## Power available by 2009

The NTL project consists of a 287 kilovolt extension to the existing power line infrastructure from the line's current terminus at Meziadin Junction to Iskut along the Highway 37 corridor, together with an upgrade to the existing Skeena-Meziadin transmission line from 138 kV to 287 kV.

BCTC said it is considering an in-service date of fall 2009 for the 200-mile section from Meziadin to Bob Quinn Lake, with a temporary connection to the existing 138 kV line at Meziadin. Planning on the sections between Skeena near the town of Terrace and Meziadin is still based on an in-service date of fall 2010.

BcMetals said Jan. 17 that construction of the Red Chris mine would be completed by fall 2009, if it began this spring.

The company cannot begin construction on the Red Chris project under the conditions of its environmental assessment certificate without a viable source of power. Its financing for the project with Investec Bank UK Ltd. also depends on a reliable power source.

However, Red Chris does not require completion of the upgrade to the Skeena-Meziadin Junction section to commence operations, the company added.

Unlike many projects, where junior mining companies enter into partnerships or sell their properties to larger companies, BcMetals had hoped to develop the Red Chris deposit itself with the support of a limited partnership with Global International Jiangxi Copper Company Ltd., a Hong Kong investment company that had agreed to purchase a 75 interest in the venture and metal concentrates produced at the mine.

BcMetals shareholders were scheduled to vote on the deal at special meeting Feb. 14.

However, BcMetals abruptly canceled the special meeting and advised holders of BcMetals stock, warrants and options Feb. 14 to tender all of their securities to the Imperial buyout offer, which expired Feb. 16. The company's managers and directors also indicated that they intended to submit their own BcMetals securities to the Imperial offer as well. ●



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Petroleum news

*North of 60 Mining News is a monthly supplement of the weekly newspaper, Petroleum News. It will be published in the fourth or fifth week of every month.*



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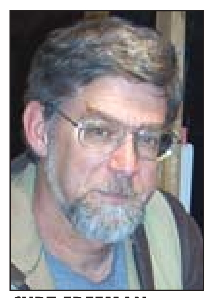
● GUEST COLUMN

# Alaska mining news summary: Tight personnel, equipment market in busy mining industry

Okay, the lull is over. It lasted about 25, maybe 30 minutes, after I wrote those prophetic but ill-considered words in late January! Shortly after that point I was in Vancouver for the annual Cordilleran Roundup mining conference, an annual barometer of mining activity in western North America if not the world. What I saw at the 2007 conference was a crowd well in excess of 5,000, populated by two types of people: those who were smiling from ear to ear and those whose terrified eyes reminded me of a whitetail deer in the headlights. Those smiling were providing services to the industry; those not smiling were trying to acquire those services. The acute shortage of technical personnel, drills, analytical capacity, helicopters and other services has driven costs to record levels with no end in sight for the worldwide demand for metals that is behind it all. Might as well take off your spurs, this pony is already running flat out!

### The author


CURT FREEMAN

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## Western Alaska

**TECK COMINCO AMERICAN** announced stunning fourth-quarter and year-end 2006 results from its Red Dog mine. In the fourth quarter the mine produced 133,600 tonnes of zinc in concentrate and for the year the mine produced 557,500 tonnes of zinc in concentrate. Zinc ore grade decreased to 19.9 percent while mill recoveries decreased slightly to 82.8 percent for the fourth quarter. The mine also produced 33,000 tonnes of lead in concentrate during the fourth quarter and 123,500 tonnes of lead in concentrate for the year. Lead ore grade decreased to 5.7 percent while mill recoveries increased to 65.6 percent for the fourth quarter. As a result primarily of higher zinc and lead prices (average $1.91 and 74 cents per pound respectively for the quarter), the mine posted a whopping $623 million operating profit for the quarter and a $1.079 billion (yes, billion, Dorothy) operating profit for the year, both significant increases over profits for the year and the fourth quarter of 2005. Another seminal event occurred in the fourth quarter: Capital expenditures for mine construction, including an interest factor, were fully recovered. In other words, mine payback was achieved and they burned the mortgage!

**ST ANDREW GOLDFIELDS LTD**. announced the first shipment of gold doré from its newly recommissioned Nixon Fork mine north of McGrath. The commissioning process was completed at the end of December and the mine is now producing copper concentrates and gold doré at the design rate of 150 tons per day. Installation of a cyanide leach circuit is under way and once completed in the summer of 2007 will allow improved gold recovery from the existing underground ore as well as re-treatment of previously milled tailings. The company anticipates that the mine will achieve a production rate of 40,000 ounces of gold in 2007.

**RIO TINTO** announced that it had acquired an additional 9.4 million shares of Northern Dynasty bringing the former's cumulative equity interest to 19.9 percent of Northern Dynasty's stock. Northern Dynasty controls the world class Pebble porphyry copper-gold-molybdenum deposit north of Iliamna. The Tundra Telegraph says that Rio Tinto will eventually take over effective control of the company and the deposit; however Rio Tinto indicated it had no current intentions to either increase its ownership position or sell its current share position.

**PACIFIC NORTH WEST CAPITAL** announced year-end results from its Goodnews Bay platinum project under lease from Calista Corp. in southwest Alaska. Field exploration efforts in 2006 focused on the Susie Mountain area of the project where historical exploration resulted in discovery of plus 1 gram per tonne platinum in rock and soil samples. The 2006 evaluation program consisted of rock, stream silt, pan concentrate and power auger basal soil sampling. Soil sampling returned platinum values as high as 268 ppb from the basal soil layer on the southwest flank of Susie Mountain. The anomalous values are underlain by clinopyroxene dominated rocks. The approximate 650,000 ounces of placer platinum recovered historically from the Salmon River basin likely originated from Red Mountain which may represent a more deeply eroded, fault offset portion of Susie Mountain. Additional field work is planned for 2007.

**TNR GOLD CORP.** announced final results from Phase II drilling at its Shotgun project north of Dillingham. A total of seven holes drilled in the Winchester prospect suggest that gold mineralization is closely associated with light grey, equigranular, fine- to medium-grained felsic intrusive sills and is not restricted to brecciated zones or veins. The light grey intrusive grades into other phases including a porphyry, where it continues to carry significant gold. Significant results from five newly released drill holes include 1.2 meters of 9.81 grams of gold per tonne and 9.2 meters grading 1.85 grams of gold per tonne in hole 6-52 and 13.4 meters grading 1.22 grams of gold per tonne in hole 6-53. Additional drilling is planned for 2007.

**ANDOVER VENTURES** announced 2006 drilling results from its Bulk Gold project north of Nome. Eight core holes totaling 285.7 meters were drilled on two of the four target areas. Significant results include 5.7 meters grading 1.20 grams of gold per tonne in hole 06BGDH-5. Anomalous arsenic and antimony were associated with mineralized intervals in the drilling. In addition, soil sampling in 2006 extended the soil anomaly another 200 meters to the southwest with soil values up to 1.26 grams of gold per tonne. Additional work is planned in 2007.

## Eastern Interior

**TECK COMINCO** announced that 2006 production from the Pogo mine was 112,500 ounces of gold. Operating costs were not released because the mine has not yet reached commercial rated production. The mine is expected to reach commercial production by April 2007 following completion of the filter plant expansion project with full production anticipated in May. Gold production for 2007 is expected to be 340,000 ounces.

**INTERNATIONAL TOWER HILL MINES LTD.** announced the results of its 2006 drill program at the LMS gold project near Delta Junction. Significant intercepts include 5.7 meters grading 2.7 grams of gold per tonne and 16 grams of silver per tonne in hole LM-06-36, which was a 170 meter step out from earlier drilling. In addition, high grade zones were expanded with intercepts of 1.7 meters grading 12.0 grams of gold per tonne and 59 grams of silver per tonne in hole LM-06-31 and 0.3 meters grading 69 grams of gold per tonne and 18.9 grams of silver per tonne in hole LM-06-25. A total of 2750 meters of core was drilled in eight holes.

The current drilling continues to expand the previously defined Camp Zone mineralization. Soil sampling has also defined new targets along the mineralized zone. Continuity of mineralization has been established over an area of 250 by 450 meters and remains open to the northwest and at depth. Mineralization appears to be preferentially developed on the north dipping limb of a broad fold. A $750,000 core drilling, auger drilling and soil sampling program is planned for 2007.

International Tower Hill Mines Ltd. also announced the results of its 2006 drill program at the Livengood gold project north of Fairbanks. A total of 1,227 meters were drilled and multi-gram gold grades were encountered in four of the five holes completed. Higher grade gold was intersected over substantial widths including hole MK-06-07 which returned 94.6 meters grading 1.59 grams of gold per tonne including 30.5 meters grading 2.8 grams of gold per tonne. Higher grade mineralization is associated with increased vein density within a volcanic or subvolcanic intrusive breccia complex. The highest grades are associated with poly-phase quartz-arsenopyrite veinlets. Additional drilling is planned for early 2007.

see FREEMAN page 5

● GUEST COLUMN

# Mining and the Law: The miners are coming! The miners are coming!

By J.P. TANGEN
*Guest Columnist*

According to a recent World Trade Center Alaska report, for the 11-month period ending Nov. 30, 2006, mining exports represented more than 25 percent of the state's foreign exports, and foreign exports constituted 10 percent of Alaska's Gross Domestic Product. At $2 billion, mining was second only to seafood and twice the value of petroleum products.

With the gas pipeline trailing off over the distant horizon, the role of mining in Alaska's economy during the next decade is destined to increase. Naysayers and NIMBYs should take notice: the industry is on its way in a big way. Furthermore, the mine workers in the state are starting to push back. Against the backdrop of the war of words that the Pebble project has spawned, the mine workers at Kensington have taken out paid ads challenging the directors of the Southeast Alaska Conservation Council by name.

Of course, there are plenty of things that can go wrong, but if metal prices remain high, then the public policy wonks, elected as well as self-ordained, will have to deal with the panoply of new issues that this emerging industry will present.

**Mining & the law**

J.P. TANGEN

The author, J.P. Tangen has been practicing mining law in Alaska since 1975. He can be reached at jpt@jptangen.com or visit his Web site at www.jptangen.com. His opinions do not necessarily reflect those of the publishers of Mining News and Petroleum News.

### No revenues until mines operational

For one thing, the long-ignored matter of mining economics will have to be addressed. Legislators must be persuaded that the gestation period for a mine is often seven years. Unlike other industries where the tax revenue can be realized shortly after the cowboys come to town, mines have to be permitted, built and operational before they generate revenue.

*Now is a great time for Alaskans to make peace with its mining heritage. Mining is coming to Alaska with more vigor than has been seen in over 100 years.*

Another bit of bad news is that latent xenophobia will have to be sublimated. Most mining money is raised on the Canadian stock exchanges, so the initial representatives on any project will have strong Canadian ties. Since Canadians are generally pretty nice people, that's not a bad thing. Furthermore, their bucks are green by the time they get here. But the bad habit of pointing out that it is a Canadian mining company coming through the door needs to end. Besides, they hire Alaskans, and very frequently Alaskans who live close to the project, and that is a very good thing.

### Rural projects have local impacts

Rural projects near Kotzebue and Delta have made big impacts in remote Alaska on folks who vote. Larger economies will continue to get their fair share of the economic pie, of course, but a 500-person workforce with spouses and kids needs nearby schools and malls. Sooner or later there will be a Starbucks in Nome and a Costco in McGrath.

Also sneaking up on the state is the educational process. As more kids know miners, they will be drawn to good-paying mining jobs. Mines need engineers and economists as well as drillers and core loggers. The University of Alaska Anchorage has nearly 100 students in its new geology department; and it will grow, in no small part due to the fact that these young workers will have no trouble finding mining jobs in Alaska this summer.

Now is a great time for Alaskans to make peace with the state's mining heritage. Mining is coming to Alaska with more vigor than has been seen in over 100 years. May the devil take the hindmost. ●

*continued from page 4*

## FREEMAN

### Northern Alaska

**SILVERADO GOLD MINES LTD.** announced a lode gold discovery on its Nolan property in the Brooks Range. The company's 2006 exploration program included 920 feet of backhoe trenching in an area north of Smith Creek. The trenching was conducted on the Solomon Shear, a five mile long gold bearing shear zone containing gold-antimony quartz veins. The "main zone" contains 16 veins over 190 feet across strike. Individual veins vary in width from a quarter inch to seven inches. Spacing of veins also varies, from a quarter inch to several feet. One-to 10-foot channel samples returned values ranging from 0.01 to 0.83 ounces of gold per ton with antimony values ranging from 0.01 percent to 46.33 percent. A single reverse circulation drill hole targeted at this zone returned several intervals containing anomalous gold and antimony including a 5 foot interval which returned 0.06 ounces of gold per ton and 1.61 percent antimony. Additional drilling is planned for 2007.

**LITTLE SQUAW GOLD MINING** announced that the State of Alaska recently obtained right-of-way access into the Chandalar area where the company is exploring its Little Squaw gold project. In 2005 the State of Alaska sued the U.S. Department of the Interior for rights of way on the historic Coldfoot-Chandalar and Caro-Coldfoot trails. The State of Alaska and the federal government recently agreed to a pre-trial settlement of the action. The company indicated that it has initiated efforts to have an all-weather road built from the existing Dalton Highway to the company's Little Squaw project.

### Southeast Alaska

**FULL METAL MINERALS** announced drill results from its Mount Andrew copper-gold project in Southeast Alaska. Four of five holes completed encountered multiple intersections of magnetite-chalcopyrite mineralization which remains open in all directions. Andestic host rocks commonly exhibit tactite-style alteration, coupled with strong potassic alteration. Significant results included hole KMA06-01 which intercepted 29.8 meters grading 0.87 percent coppers, 0.12 grams of gold per tonne and 3.55 grams of silver per tonne and hole KMA06-03 which intercepted 48.8 meters grading 0.72 percent coppers, 0.06 grams of gold per tonne and 2.89 grams of silver per tonne. Historic production from Mount Andrew and adjacent mining operations totaled 5,729 tonnes copper, 1.74 tonnes silver and 216 kilograms of gold. Additional drilling is planned for 2007.

**NIBLACK MINING** announced additional results from metallic screen gold analyses of 2006 drilling at its Niblack volcanogenic massive sulfide project in southeast Alaska. This re-analysis technique is widely used in systems with coarse visible gold such as Niblack. Combined metallic screen and standard fire assay results yielded 39.27 grams of gold per tonne and 284 grams of silver per tonne over 6.77 meters in drill hole LO-176, more than doubling the previously reported grade. The interval occurs within a near-surface oxide zone that is leached of base metal sulfides and is part of a wider 13.2 meter interval grading 23.19 grams of gold per tonne and 152 grams of silver per tonne. In addition, multi-element analyses have indicated significant enrichment in gallium and indium in drill core. Individual samples assayed up to 112.5 grams of gallium per tonne and 55.3 grams of indium per tonne. These rare metals can be important smelter by-product credits in polymetallic concentrates. The company plans to commence an underground exploration program in 2007 that is designed to expand the Lookout Zone at depth.

### Other

**ALASKA GOV. SARAH PALIN** announced that Tom Irwin has been named Commissioner of the Department of Natural Resources. Marty Rutherford has been named Deputy Commissioner. Irwin was the Commissioner of DNR from January 2003 to October 2005 while Rutherford was Deputy Commissioner from 1992 to 2005. Both individuals resigned in 2005 over differences they had with then-Gov. Murkowski's handling of the Alaska natural gas pipeline negotiations. Congratulations Tom and Marty! ●

● ALASKA

# Pebble East goes richer and deeper

*Expanded resources suggest project could now be 'Prudhoe Bay of Alaska mining,' according to Dick Cattanach of Truth About Pebble*

By SARAH HURST

*For Mining News*

A new resource estimate for Northern Dynasty's Pebble project in southwest Alaska makes it one of the world's most important copper-gold-molybdenum deposits, the company said Feb. 20. Inferred resources in the Pebble East deposit have increased nearly 90 percent, to 3.4 billion metric tons.

NEWS FLASH

Pebble East is contiguous to and deeper than the 4.1 billion-ton near-surface Pebble West deposit, and is higher grade. Pebble West was the first area explored and is the potential location for an open pit mine. Geotechnical assessment has shown that Pebble East is amenable to low-cost, bulk underground mining, according to Northern Dynasty.

At a 0.60 percent copper equivalent cutoff, the estimated inferred mineral resources in the Pebble East deposit are now 3.4 billion tons grading 1.0 percent copper equivalent, containing 42.6 billion pounds of copper, 39.6 million ounces of gold and 2.7 billion pounds of molybdenum. At a 1.0 percent copper equivalent cutoff, the estimated inferred resources are 1.4 billion tons grading 1.29 percent copper equivalent, containing 24.6 billion pounds of copper, 20.9 million ounces of gold, and 1.2 billion pounds of molybdenum.

## Pebble East: 132 core holes drilled

The new estimate is based on assay results from 132 core holes drilled in the Pebble East area. The estimate was audited by geological and mining consultants at Scott Wilson Roscoe Postle Associates, under the direction of David W. Rennie, P.Eng., an independent qualified person as defined by Canada's National Instrument 43-101, the regulations for assessing mineral resources.

"I think it's really exciting — the opponents out there can no longer claim that this is a stock play," Steve Borell, executive director of the Alaska Miners Association, told Mining News. "It's an indication of just how much opportunity exists in Alaska ... Opportunities for mineral development are just beginning to be realized." The chorus of opposition to Pebble is no different from what happens to projects everywhere else in the world, Borell said. "It's almost as if there's a death wish for the economy," he added.

A few weeks before the latest resource estimate was published, mining major Rio Tinto increased its indirect ownership in Northern Dynasty from 9.9 percent to 19.79 percent. On Feb. 1 Northern Dynasty was selected to receive the Thayer Lindsley International Discovery Award from the Prospector's and Developer's Association of Canada. The Thayer Lindsley Award is presented annually to recognize an individual or a team of explorers credited with a recent significant mineral discovery anywhere in the world. ●

● ALASKA

# State approves Pebble exploration plans

*After careful review, DNR finds no basis to accusations that drilling will harm environment, habitat or subsistence resources*

By SARAH HURST

*For Mining News*

Alaska's Department of Natural Resources has refuted a legal challenge to Vancouver-based Northern Dynasty Minerals' exploration plans for the Pebble project this year. The company has already drilled over 600 holes, but formal opposition to the continued work was submitted in January by Anchorage attorney Geoffrey Parker on behalf of the Renewable Resources Coalition, Trout Unlimited, the Nondalton Tribal Council, Nunamta Aulukestai (Caretakers of Our Lands) and Robert B. Gillam.

"Although a DNR response is not required, I ... felt it was important to respond to your letter in order to clarify DNR's position on some of the matters you raised," Large Project Coordinator Tom Crafford wrote in an eight-page reply to Parker Feb. 9. "It is important to recognize ... that although the state maintains a financial agreement with NDM for the reimbursement of the state's large project review team expenses associated with the Pebble project, this relationship in no way diminishes or compromises the state's independent function, authority or responsibility in its review or permitting of the Pebble project," Crafford emphasized.

Northern Dynasty's Alaska Hardrock Exploration Application is for exploration and baseline studies activities that do not involve major excavations or construction of permanent facilities, Crafford noted. The Alaska Coastal Management Program consistency determination review of the application took into consideration the comments by Parker and other members of the public, and found no problems with Northern Dynasty's proposed activities, according to Crafford.

## Baseline data not required for exploration

"DNR should demand that NDM respond to agency comments on baseline study plans and that NDM provide the baseline data it collected in 2005 and 2006," Parker said. Crafford responded that most of these data are being collected for National Environmental Policy Act purposes and are not required for exploration permitting. "DNR does not need all of the information NDM and/or their consultants have acquired or will yet acquire concerning hydrology, geology, water chemistry, wildlife, fish subsistence and local resident use ... in order to gauge the impacts of this year's proposed exploration activities," he wrote.

"If and when the Pebble project proceeds to development permitting, the public and state and federal agencies will have multiple opportunities to review and judge the adequacy of NDM's environmental baseline studies," Crafford continued. "NDM has voluntarily presented summaries of their study plans and baseline studies to state and federal agencies, but these presentations were not required," he added.

Drilling by Northern Dynasty will not be authorized to occur closer than 100 feet from any water body, and seismic exploration cannot occur any closer than 200 feet to any water body, so the reviewing agencies believe that the impacts of the exploration activities can be accurately assessed within the outlined areas, Crafford said. The project is not located in an ACMP-approved designated subsistence use area, but potential impacts to subsistence use were analyzed, and it was determined that the Pebble exploration will not limit access to subsistence resources or increase the use of subsistence resources by non-rural residents, he noted.

The exploration activities are not expected to cause significant adverse impacts to habitat, according to Crafford. "There will be no dredging or fill activities, no change in drainage patterns, surface water quality, and natural groundwater recharge areas, and very minimal disturbance to vegetation," he told Parker. The attorney had suggested that agencies failed to analyze the impacts of Northern Dynasty's activities on wildlife and subsistence.

## DNR will inspect water use compliance

Parker also asserted that DNR could not reasonably determine the effects of Northern Dynasty's water appropriations on water flow and fish populations "because NDM failed to provide sufficient information for DNR to make such a determination." Crafford listed the documents that Northern Dynasty had supplied to DNR, which included a map showing areas where water would be withdrawn and used, and specifications of the quantity of water to be used and the type and size of equipment to be used to withdraw the water.

In accordance with its Fish Habitat permits, Northern Dynasty must use a screen mesh to surround the water intake structure to avoid entrainment, impingement or injury to fish. Adequate flow must remain in the watercourse to provide for the efficient passage and movement of fish. DNR staff will conduct field inspections to ensure permit compliance, Crafford noted.

"If one were to assume that water

see EXPLORATION page 7

● ALASKA

# Legislature attacks Pebble on two fronts

*Bills in Alaska House and Senate aim to protect fish and wildlife but could be disastrous for Bristol Bay area development*

**By SARAH HURST**
*For Mining News*

Seven Alaska legislators are endorsing two new bills on the protection of salmon and wildlife that would effectively block the development of the proposed Pebble mine. Rep. Bryce Edgmon, D-Dillingham, who ousted incumbent Carl Moses on a coin flip last year, has introduced House Bill 134, and Senate Majority Leader Gary Stevens, R-Kodiak, has introduced Senate Bill 67. The co-sponsors of Edgmon's bill are Jay Ramras, Nancy Dahlstrom, Les Gara and Beth Kerttula; the co-sponsor of Stevens' bill is Johnny Ellis.

**Rep. Bryce Edgmon has introduced a bill that would prohibit the industrial use of water in the Bristol Bay area.**

The Senate bill is titled, "An Act establishing the Jay Hammond State Game Refuge." It designates all state-owned surface and sub-surface land and water within the boundaries of the Kvichak and Nushagak-Mulchatna River drainages, excluding Wood-Tikchik State Park, as the Jay Hammond State Game Refuge "for the protection of salmon, trout, caribou, brown bear, and other fish and wildlife species and their habitat and for the use and enjoyment of the people of the state."

Jay Hammond was a popular former Alaska governor who died in 2005. He lived in the Bristol Bay area and expressed concerns about the possible development of Pebble. His wife, Bella, visited the Legislature recently to offer her support for SB 67. The refuge would encompass over 7.7 million acres of land.

### SB 67 would 'add a layer of protection'

The Senate bill would prohibit "the storage and disposal of industrial waste and the discharge of water that does not meet water quality standards for the growth and propagation of fish" within the boundaries of the Jay Hammond State Game Refuge. "While SB 67 establishes certain criteria for resource use and development within the Jay Hammond State Game Refuge, it is not intended to stifle resource development in this area, but to add a layer of protection to a fragile ecosystem, and to make sure any such development proceeds carefully," Sen. Stevens said in his sponsor statement.

"I am a supporter of Jay Hammond and have the deepest respect for him and his wife, Bella. I feel a refuge named in his honor is certainly fitting," Gov. Sarah Palin told Mining News through her spokeswoman. "However, with the talk of politics behind the proposal of a refuge, we need to look at the areas impacted and make sure needs are met for responsible development while ensuring proper recognition for the late governor," she added.

### House bill would protect drainages

The House bill is titled, "An Act relating to conservation and protection of wild salmon production in drainages affecting the Bristol Bay Fisheries Reserve." It states that within the watersheds of the Nushagak, Kvichak, Naknek, Egegik and Ugashik Rivers, a person may not "withdraw, obstruct, divert, inject, pollute, or pump, either temporarily or permanently, any subsurface or surface water in drainages supporting salmon or any water hydrologically interrelated or connected to these drainages; or alter, destroy, displace, relocate, channel, dam, convert to dry land, or otherwise adversely affect any portion of a river, stream, lake, bog, tributary, or any other water body, including the beds of water bodies, in drainages supporting salmon."

The bill makes exceptions for uses previously authorized and permitted, as well as drinking water and domestic uses, ordinary existing and future municipal uses, and traditional, cultural or residential uses.

"We believe that salmon are so vitally important to our region that they deserve the highest level of protection possible. Our salmon are world class in value and reputation," Edgmon told Mining News. He expects that the bill will get "tremendous discussion" and acknowledges that it is "sweeping in its impact." Edgmon said the bill is just a framework for debate and that he is amenable to changes.

"I'm pro-development by nature and I fully intend to be a strong supporter of the mining industry," Edgmon said. Mining can be done responsibly and "provides vital economic benefits and jobs to Alaskans," he added. Edgmon has even encouraged people in the Bristol Bay area to seek employment with the Pebble project during the exploration phase, he said. He has found that some people are conflicted about working there because they are worried about what might happen if a mine is developed. The cost could be "permanent and irreparable," Edgmon said.

### Northern Dynasty sees bills as threat

Although Stevens and Edgmon both argue that resource development could still take place if their bills pass, Vancouver-based Northern Dynasty disagrees. "Both bills would foreclose any opportunity for mineral development. ... It's absolutely clear, notwithstanding the protestations of the authors," the company's vice president of public affairs, Sean Magee, told Mining News. The bills would also block oil and gas development and some forms of fish processing, he added.

Northern Dynasty wasn't surprised that the bills were introduced, because a high-profile campaign is being waged against Pebble, but the company was surprised at how far-reaching the bills are, Magee said. "In their zest to kill this project they are willing to lock up so much area — the implications of these are enormous," he added. The bills may not be consistent with the Alaska constitution, which provides for the development of natural resources for the benefit of all Alaskans, Magee pointed out.

"I'm optimistic that the Legislature will see the light ... but we don't take anything for granted," Magee said. "Our view is that this is not good public policy for Alaska." Northern Dynasty is encouraging people to testify to the Legislature that Pebble should be allowed to go through the state's permitting process without further obstacles being placed in its way.

Truth About Pebble, the newly formed organization that is supporting the project, has already made its views about the bill known. "I think it's time Alaskans woke up and asked themselves just what we're doing to our resource base," said Truth About Pebble co-chair Gail Phillips. "Why should we set aside millions of acres of state land that's been designated under our constitution for resource development to stop a project that hasn't even been proposed yet? What is going on in the state of Alaska?" ●

*continued from page 6*

## EXPLORATION

obtained for the support of all seven drilling rigs came from one tributary of the Upper Talarik, the authorized daily volume would be 113,400 gallons of water per day or an equivalent of 0.175 cubic feet of water per second," Crafford told Parker. "This represents less than five percent of the minimum mean daily flow recorded for the period of July 2004 through June 2006," he added. DNR's evaluation indicates that the proposed water withdrawal will have little to no measurable effect on the resources or hydrology of either the South Fork Koktuli River or Upper Talarik Creek watersheds, Crafford said.

### Drilling waste, fuel storage regulated

Parker was also incorrect in arguing that "DNR cannot reasonably determine the impacts of NDM's waste disposal plans and the risks posed by storage of 5,000 gallons of airplane fuel unless NDM provides more specific information," according to Crafford. Most rock cuttings are returned to the drill hole from which they came, and the remainder must be buried in a pit and covered with the vegetative mat that was removed when the drill site was constructed. These and other stipulations ensure that environmental impacts from drilling waste will be "negligible," Crafford said. Regulations on the storage of fuel are equally stringent, he added.

In the most ambitious of his points, Parker requested that "DNR should condition its approval of NDM exploration permit applications on NDM's express and total waiver of any takings claims against the state and federal governments in the event NDM is not permitted to build and operate Pebble mine. ... Failure to demand such a waiver is likely to result in accusations against DNR for failing to protect the state when it had the opportunity to do so."

An attorney for the state wrote a memo recently that suggested Northern Dynasty might be able to claim millions of dollars in compensation if the project is blocked. Subsequently three attorneys for Trout Unlimited, one of the groups that is opposing Pebble, wrote a memo arguing that Northern Dynasty would likely be unable to establish a claim. "DNR seriously questions the legality of this recommended action and feels that it would be unwise and imprudent to pursue it," Crafford replied to Parker's request for a waiver of takings claims. ●


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● YUKON

# Unique operator cleans up old messes

*Alexco Resource tackles potentially lucrative exploration, environmental remediation at abandoned mine sites in Yukon Territory*

By ROSE RAGSDALE
*For Mining News*

Ever since prospectors rushed to the Yukon seeking gold more than a century ago, miners have been guilty of extracting the mineral riches in the North and doing a vanishing act when the veins petered out or prices fell. These miners often left behind environmental messes that occasionally became regulatory nightmares.

Now that modern-day prospectors are again venturing to the far North, many of them are seeking out old mining claims.

But before new exploration can occur, the old mine sites often must be cleaned up.

That's where a growing number of remediation and reclamation specialists come in. Some are in-house departments of large companies, while others are independent consultants. These environmental specialists return old mine sites to their natural state prior to mining activity, or remediate them as much as possible. The work often also clears the way for new exploration.

It's rare that one small company attempts to do both, remediate and explore the old mines.

One such operation is Alexco Resource Corp., a Vancouver, B.C.-based junior mining company with its eye on exploiting riches to be earned in the Yukon at both ends of today's mining spectrum.

## Why the Yukon?

"Why not the Yukon," is a better question, considering its huge size and underexplored nature, said Clynton R. Nauman, president and CEO of Alexco.

"All the productive terrains in Alaska and British Columbia traverse the Yukon. … The rule of thumb is the best place to look for an ore body is in the shadow of an existing mine," Nauman said in a telephone interview Feb. 19.

Nauman formerly served as general manager of the Greens Creek Mine Project near Juneau for several years and as president of Viceroy Resources Corp., the company that operated the Brewery Creek mine until it closed when gold prices tanked in 2002. He credits his years at Greens Creek with giving him an appreciation of the importance of environmental sensitivity in developing mine projects.

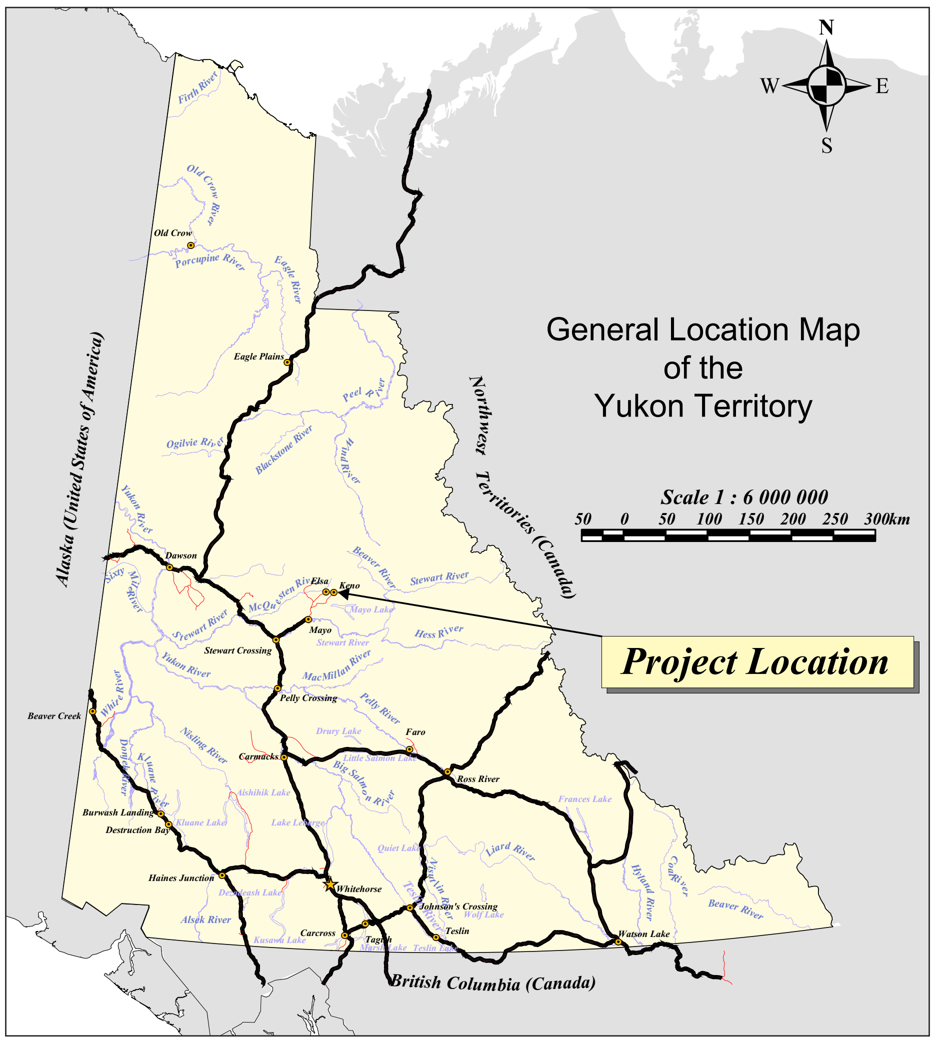
Nauman, a geologist by training, came up with the idea of combining the functions of a junior mining company and an environmental remediation services firm into one operating entity.

"As a standalone business model, I am not aware of any other like it," he said.

## NovaGold is key investor, contractor

In 2003 Nauman joined some friends and formed a small company called ALM Group ULC. ALM then joined NovaGold Resources Inc. and Quest Capital Corp. to form Alexco in 2005. Alexco completed an initial public offering in January 2006, with full-board listing on the Toronto Stock Exchange thanks to the advanced nature of the mine properties in its portfolio.

In addition, the company owns two subsidiaries, Elsa Reclamation & Development Co. Ltd. and Yukon-based Access Mining Consultants Ltd., which




COURTESY ALEXCO RESOURCE

Alexco sees Keno Hill as an unprecedented exploration opportunity as well as lucrative work for its environmental services operation.

provide mine-related environmental, reclamation and mine closure services.

From the beginning, Alexco has focused on identifying and enhancing value at the company's primary exploration properties, leveraging its exposure to silver at the United Keno Hill Mines ("Keno Hill") property in Yukon Territory and developing and improving the profitability of its environmental services business.

Alexco conducts its exploration programs with the help of 19 percent investor-owner NovaGold, which provides exploration services to the company on a contractual basis.

Alexco also enjoys other strategic advantages. These include gold-related exploration opportunities in the Yukon Territory, including the Brewery Creek and Harlan properties; and an experienced and successful management team and board of directors.

For example, one director, Rick Van Nieuwenhuyse, is president and CEO of NovaGold.

Expanding the company and increasing shareholder value is Alexco's primary objective for 2007. Nauman said the company hopes to attract more investors; generate C$1 million in remediation revenues, build its remediation business, focusing on properties with exploration potential; increase staffing levels to allow the company to take on new clients and projects; and operate with no debt.

"Given the successes of 2006, I am confident we will achieve our 2007 goals, and more," Nauman said.

## Keno Hill holds considerable promise

Currently, Alexco is focused on silver-rich Keno Hill.

The company's expertise in managing risk and unlocking value is nowhere more evident than in this abandoned mining complex, according to Nauman.

The large property is an orphaned and abandoned site comprising more than 30 historic silver-lead-zinc producing mines. It is a liability on the Canadian government's books because of considerable mine remediation and reclamation work needed on the properties.

But Alexco sees Keno Hill as an unprecedented exploration opportunity as well as lucrative work for its environmental services operation.

Alexco completed negotiations in April 2006 with federal and Yukon officials to purchase Keno Hill, assumed responsibility for environmental care and maintenance of the district through its environmental services branch and initiated a systematic exploration program to unlock additional value in the silver district. Historically exploited high-grade silver veins in the Keno Hill Mining District cover an area of about 140 square miles. Mineralization is temporally related to mid-Cretaceous-aged tombstone intrusions that are associated with significant precious metals deposits across the Yukon Territory and Alaska, including deposits such as Fort Knox, Pogo and Brewery Creek.

Records indicate that about 4.9 million tonnes of ore containing more than 40 ounces per tonne of silver together with 5.6 percent lead and 3.1 percent zinc were mined in the district between the early 1920s and 1989, producing more than 215 million ounces of silver.

Metals prices fell following the silver price manipulations of the mid-1980s and Keno Hill was forced into bankruptcy,

see ALEXCO page 10

*continued from page 9*

# ALEXCO


COURTESY ALEXCO RESOURCE

Keno 200 adit overlooking Lightning Creek

closing the mines in 1989.

In June 2005, Alexco was selected as the preferred purchaser of the assets of Keno Hill by PricewaterhouseCoopers Inc., the court-appointed interim receiver and receiver-manager of Keno Hill, due mainly to its more thorough offer.

## Lucrative remediation ahead

Under terms of the agreement, Elsa Reclamation & Development is indemnified against all historical liability, is not required to post security against pre-existing liabilities and has property access for exploration and future development.

In its assessment of Keno Hill's value, PricewaterhouseCoopers set the estimated environmental clean-up cost at C$65 million, greater than the assets of the property's known ore resources of some $50 million.

Elsa Reclamation & Development will contribute C$10 million to the cleanup effort and expects to be reimbursed more than C$50 million for future environmental reclamation activities.

Elsa Reclamation & Development also assumed responsibility for ongoing environmental care and maintenance of the site under the contract and is actively conducting a baseline environmental assessment and site characterization program.

To finalize the Keno Hill acquisition, Elsa Reclamation & Development has applied for a water license that it expects to be granted later this year or in early 2008. Upon receipt of the license, ERDC will have free and clear title to surface and subsurface claims, leases, freehold land, buildings and equipment at Keno Hill.

Nauman said Elsa Reclamation & Development and Access Mining Consultants got off to a profitable start in 2006, posting initial revenues of C$500,000 and margins of 38 percent for their first full year of operation under the Alexco banner.

As for human resources, Alexco is working with the Nacho Nyak Dun First Nation to ensure the participation of its members in all aspects of care and maintenance, reclamation, exploration and redevelopment at Keno Hill. The mine complex is within NND's traditional territory. NND members should benefit at Keno Hill from jobs creation, business and contracting opportunities, scholarships and direct employment-related training.


COURTESY ALEXCO RESOURCE

Husky shaft

Alexco recruited more than 20 workers from the nearby communities of Mayo, Keno City and Stewart Crossing last year.

In anticipation of receiving the water license, Alexco initiated a district-wide exploration program in 2006. Systematic tests of selected silver targets in the district helped the company identify potentially important resources based on historical data and understand the style and variation in mineralization across the district.

## Production decision in 2007?

Alexco aims to identify and outline a "single mine" at Keno Hill this year with a silver resource of more than 20 million ounces that will provide a short-term production opportunity, Nauman said.

In addition, the company will continue the district-wide evaluation of silver mineralization it began in 2006.

Alexco plans to have three or four rigs drilling at Keno Hill for at least eight months in 2007, drilling a minimum of 30,000 meters of both surface and deep drill holes.

Though Alexco originally estimated it would take three years of exploration before the company would be ready to decide whether to put Keno Hill back into production, Nauman said Feb. 19 that Alexco might be able to make that call this year.

"We've had a lot of help and encouragement, and I think in the third quarter we will be in a much better position to make the decision," he explained.

## Brewery Creek tops other properties

The most advanced of Alexco's other properties is the Brewery Creek gold project. Located in northwest Yukon, near Dawson City, the property was operated as an open-pit heap-leach mine by Viceroy Resource until 2002, producing about 280,000 ounces of gold from 9.5 million tonnes of ore when the mine was closed due to low gold prices. Alexco's senior management team completed reclamation of the mine in 2005, and twice won the coveted DIAND Robert E. Leckie Award for outstanding reclamation. Long-term monitoring of the site is ongoing.

*"All the productive terrains in Alaska and British Columbia traverse the Yukon. … The rule of thumb is the best place to look for an ore body is in the shadow of an existing mine."*

**—Clynton R. Nauman, president and CEO of Alexco**

At Brewery Creek, widespread mineralization occurs over 9 miles of strike length in a series of small, shallow, oxide gold deposits discovered and exploited by Viceroy.

In 2006, Alexco conducted an initial test of the Bohemian zone, a sulfide resource outlined by Viceroy during its tenure on the property. Drill assays from the program returned promising results that confirm the presence of significant gold mineralization in a style and geologic setting analogous to Donlin Creek, the company said. Through September 2006, Alexco invested about C$700,000 at Brewery Creek for the 2006 work program.

NovaGold maintains a back-in and joint venture option on the property.

Alexco and its subsidiaries own a 70 percent interest in the McQuesten gold property a few miles northwest of the Keno Hill Mining District and at least a majority interest in several early stage Yukon properties, including Harlan, in the Mayo Mining District; Sprogge north of Watson Lake along Yukon Highway 10; and Klondike, about 18 miles from Brewery Creek east of Dawson City. ●

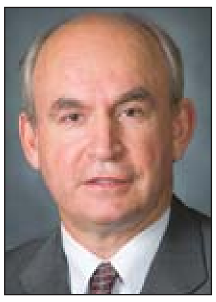
● BRITISH COLUMBIA

# Explorers going wild in British Columbia

*As the value of B.C. copper production exceeded that of coal for the first time, more and more companies looked for metals in 2006*

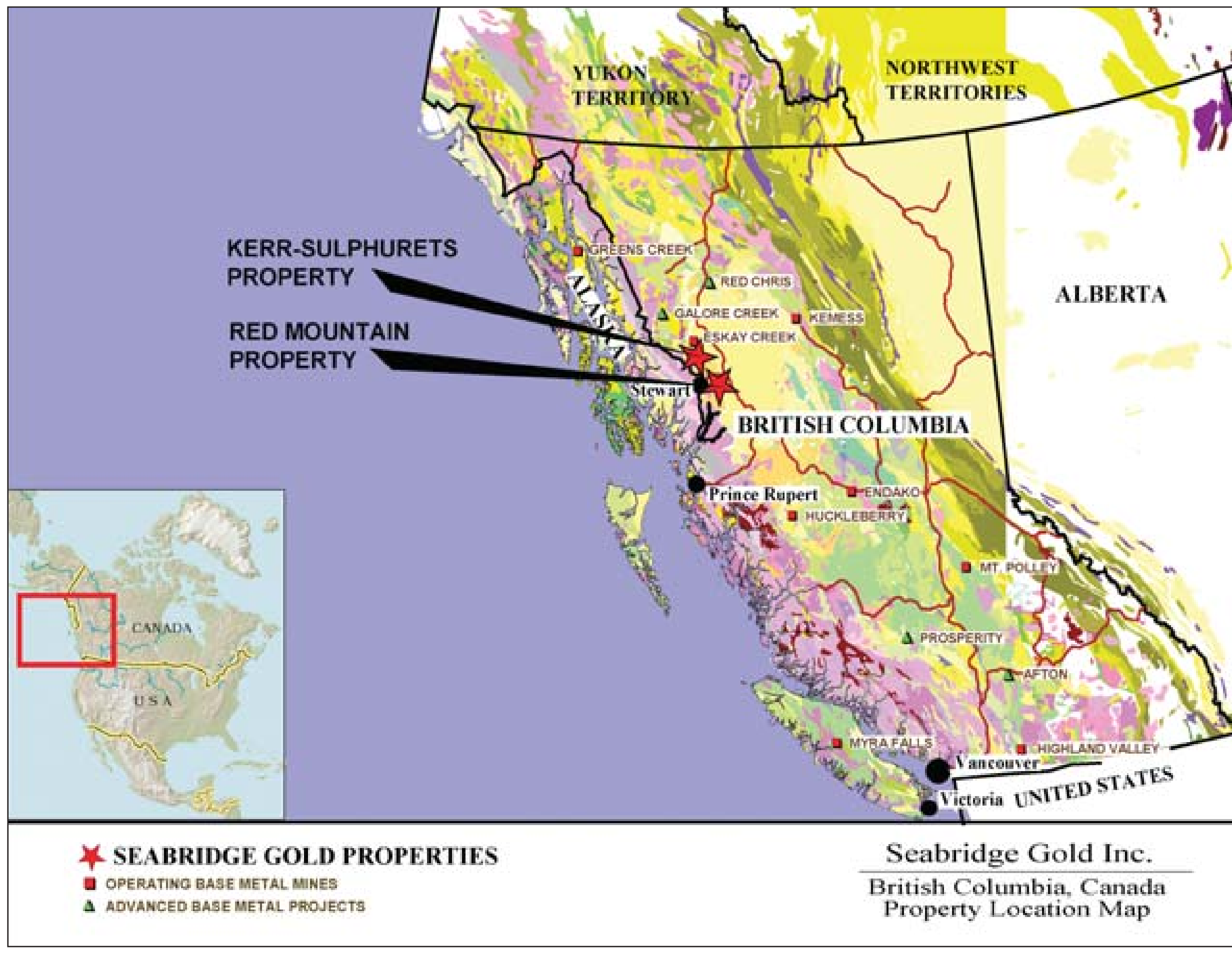
**By SARAH HURST**
*For Mining News*

Exploration spending in British Columbia hit a record high of C$265 million in 2006, a figure that the province's mining minister, Bill Bennett was proud to announce at the recent Mineral Exploration Roundup in Vancouver. Unfortunately for Bennett, he probably won't be invited to boast about the industry's successes next year, since he was forced to resign in early February after sending an obscenity-laced email to a gun club member.


British Columbia's mining minister, Bill Bennett, resigned shortly after his speech at Roundup.

"British Columbians want good jobs, and they also, frankly, want the tax revenues that come out of successful mining," Bennett said at Roundup Jan. 29. He identified four challenges facing the industry — the federal approvals process, which Bennett described as "dysfunctional" and "slower than a herd of turtles"; the provincial government's lack of capacity; British Columbia's lack of infrastructure; and the shortage of skilled people to find, build and operate mines.

The "Mining Rocks" career and job fair made 24 stops around the province last year, Bennett said. "Many people who were working in the service sector making minimum wage got good jobs and changed their lives," he added. During Roundup Premier Gordon Campbell announced that the province and the federal government would invest C$2.8 million to help youth from rural and First Nations communities in northwestern British Columbia get the hands-on experience they need to develop careers in mining, in a Reclamation and Prospecting Program.




## Terrane has one of more advanced projects

One of the more advanced projects in British Columbia is Mount Milligan, owned by Vancouver-based Terrane Metals. Terrane was formed in 2006 after the divestment of some of Placer Dome's assets from Barrick Gold. Another mining major, Goldcorp, owns 70 percent of Terrane's shares. The Mount Milligan porphyry copper-gold deposit is in the feasibility and permitting stage, the company's chief geologist, Darin Labrenz, said at the Roundup.

Mount Milligan is 96 miles northwest of Prince

see **EXPLORERS** page 12

*continued from page 11*

# EXPLORERS

George and 59 miles west of Mackenzie in central British Columbia, within easy access of infrastructure such as roads, a railway and the power grid. The property hosts a measured and indicated resource totaling almost 206 million metric tons grading 0.6 grams per ton of gold and 0.247 percent copper, containing 3.7 million ounces of gold and 1.12 billion pounds of copper.

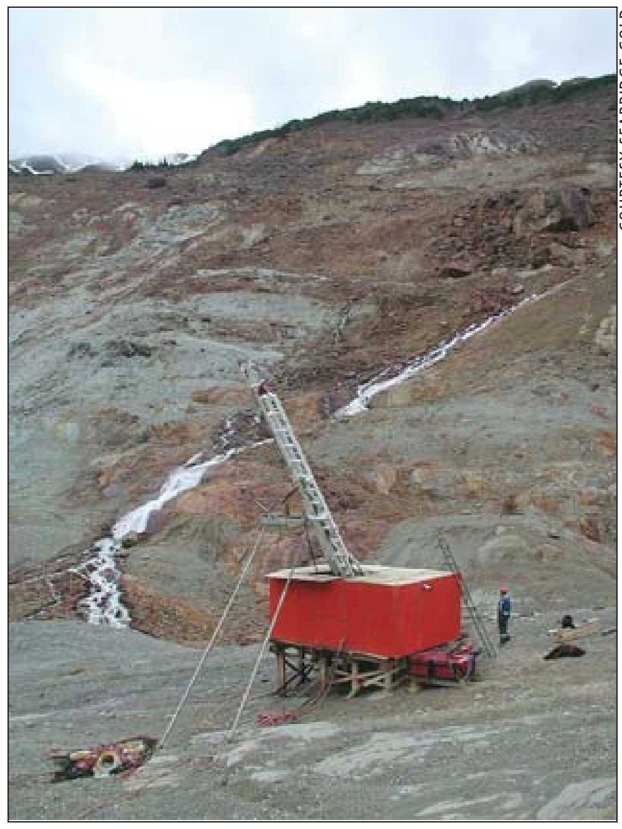
More than 900 holes have been drilled at Mount Milligan, 700 of which were drilled in the two-year period 1989-1990. "Mineralization on the property is associated with hydrothermal alteration of intrusive bodies and the surrounding host rocks," Labrenz said. The Witch Lake succession hosts the Mount Milligan deposit, and is characterized by augite-phyric volcaniclastic and coherent basaltic andesites, with subordinate epiclastic beds.

In 1993 Placer Dome obtained permits to place Mount Milligan into commercial production, but after metal prices declined the project was shelved and the permits expired in 2003. "There has been extensive 3D modeling completed on the project and we are working to improve this model," Labrenz said. Terrane is currently completing a 22-hole, 8,200-meter drill program to convert inferred resources into measured and indicated.

## Bell Resources working Granduc

In northwestern British Columbia, 25 miles northwest of Stewart, Vancouver-based Bell Resources is hoping to bring the historic Granduc copper mine back into production. Granduc operated under Newmont and subsequently Esso Minerals Canada between 1968 and 1984. Low copper prices forced the closure of the mine and demolition of the mill facilities in 1985.

Glen Zinn, a former vice president for corporate development and exploration with Hecla, came out of retirement in 2004 and revived Granduc's prospects while the copper price was less than $1 a pound. "He knew Granduc was sitting up there in the frozen north, and when the time was right and Granduc was on the auction block for a few pennies, he picked it up and put it into Bell Resources," Bell's vice president for exploration, Tim Marsh, said at Roundup. Zinn also became Bell's CEO and president.



COURTESY SEABRIDGE GOLD

**Research studies suggest there could be a significant gold and copper ore body at Kerr-Sulphurets in northwestern British Columbia.**

"It's been Bell's intent all along not to re-drill what was known in the past, but to step out along strike and down dip and show just how big this Granduc really is," Marsh said. "Today all that infrastructure underground, much of it is still in place, it needs a fresh coat of paint. The rails have been ripped out of the tunnel, so we're thinking of converting to rubber tires and a slurry pipeline system to get material out."

Granduc is a Besshi-type massive sulfide deposit, a kind of deposit that is named after Besshi copper mine in Japan, which Sumitomo operated for 283 years from 1691. Windy Craggy, 125 miles north of Granduc, is the largest known Besshi deposit to date. "These deposits start out on the sea floor and end up on continental crust and through the process of accretion and obduction they generally suffer quite a bit of metamorphism," Marsh said. Bell plans to produce a copper concentrate and a magnetite concentrate at Granduc.

Some of Bell's drilling has been on the South Leduc glacier, at times through 400 feet of ice. The glacier has been melting rapidly and has retreated about 700 feet southward and 400 feet vertically downward. The company has also been drilling on steep mountains, but this year Bell will be drilling underground, so it will be possible to work 12 months of the year instead of just four, and to avoid hazards above ground and get closer to the ore body, Marsh said.

## Seabridge working Kerr-Sulphurets

Close to Granduc, Toronto-based Seabridge Gold has been working on its Kerr-Sulphurets project, another former Placer Dome asset. Three gold-copper deposits known as Mitchell, Sulphurets and Kerr have been identified on the property. Modern exploration at Kerr-Sulphurets began in 1960, when Granduc Mines staked claims there, and continued with the involvement of several companies until the mid-1990s, when exploration ground to a halt in British Columbia. At the same time, several research projects on the district came to a conclusion, Bill Threlkeld, a senior vice president with Seabridge, said at Roundup.

"These studies, among other results, postulated the occurrence of a significant gold and copper ore body on the order of 200 million tons in the Mitchell Creek drainage," Threlkeld said. "There are several styles of mineral occurrence in the district and this diversity of styles is indicative of an extremely large, multiphase hydrothermal system with the capacity to produce significant economic mineral deposits," he added.

Seabridge acquired Kerr-Sulphurets in 1990, and with limited capital at its disposal the company optioned the property to Noranda from 1991 to the fall of 2006. Last year Seabridge jointly explored the Mitchell target with Falconbridge (which had merged with Noranda, and has now been purchased by Xstrata), and they obtained encouraging results. "Copper and gold are associated with fine-grained sulfide minerals disseminated in the rock and in stockwork veins," Threlkeld said.

*see* **EXPLORERS** *page 13*

*continued from page 12*

# EXPLORERS

"Copper and gold are extremely consistent from the drill hole results we have so far," Threlkeld continued. "For example, in drill hole number 9, a 299-meter core hole was sampled on two-meter intervals. The lowest gold grade reported is 0.19 grams per ton and the highest is 2.89 grams per ton. The drill hole average is 0.97 grams or about 1 gram per ton over 300 meters at this point. The homogeneity of the grades and the lack of sharp grade contrast across the Mitchell deposit are relatively unique in the district and in my experience. We've not adequately explained the reason for this homogenous grade distribution. One possibility could be that the regional deformation of the system provided a mechanism to homogenize the metal concentration, but we remain open to other ideas to explain this phenomenon."

## Skygold Ventures working in Cariboo region

In the Cariboo region of south-central British Columbia, Vancouver-based Skygold Ventures is advancing its Spanish Mountain gold project. Spanish Mountain is a joint venture between Skygold and Vancouver-based Wildrose Resources, in which Skygold has a 70 percent participating interest and Wildrose has a 30 percent participating interest. Last November Skygold appointed Jeff Pontius, former North American exploration manager for AngloGold Ashanti, to its board of directors.

Skygold believes that Spanish Mountain could host a sediment hosted vein deposit, based on its proximity to a continental margin and the presence of multistage deformation and thrust deformation. SHV deposits consist of gold in quartz veins hosted by shale and siltstone sedimentary rocks. Many of these deposits are located in the former Soviet Union, including Muruntau in Uzbekistan, the largest gold mine in the world, and Sukhoy Log in Siberia, Russia's largest gold deposit.

An airborne electromagnetic survey conducted in June 2006 produced a resistivity map of the property, Skygold's project geologist, Colin Russell, said at Roundup. "Overlaying the resistivity and the geology shows excellent correlation between resistivity highs and the greywacke units. This should definitely help us to lay out the drill targets with continued success," he said. "Since drilling to date has only covered about 20 percent of the property, or an area roughly 500 meters by 1.2 kilometers, we definitely have a huge area to explore," Russell added.

"For the future, metallurgical testing is under way," Russell said. "We'll continue with regional litho-geochemical sampling, prospecting and mapping and follow up on several new showings discovered outside the current known trend. We hope to complete a minimum of 50,000-plus meters of diamond drilling to expand the main zone and test the 4-kilometer-square geochemical and geophysical anomaly and continue working towards a preliminary resource."

## Abacus working in the Afton area

Adjacent to New Gold's New Afton property near Kamloops in south-central British Columbia, Vancouver-based Abacus Mining & Exploration is also hard at work in the Afton area. In 2005 Abacus acquired the past-producing Afton mill infrastructure, tailings pond, and related permits and surface rights from Teck Cominco. Mine production at Afton ceased in 1997, but an independent assessment valued the infrastructure on the property at between C$35 million and C$39 million, Scott Weekes said at Roundup.

"Part of that infrastructure was the Ajax haul road which connected the mill area to the Ajax pits, two pits that were in operation up until the late 1990s," Weekes said. "The total land package now controlled by Abacus is in excess of 8,000 hectares and to date we've completed just under 70,000 meters of drilling."

All the main copper-gold mineralization on the Afton property is hosted within the Jurassic-age Iron Mask batholith, and is associated with the contact between the older and younger phases. "Mineralization is very strongly structurally controlled, often by structures that have been very long-lived and were probably very important during the emplacement of the batholith," Weekes said. "It's a very metallogenic-rich area," he added.

Afton consists of three main areas, known as DM/Audra, Rainbow and Ajax. DM/Audra is on the northern edge of the property and has the most favorable infrastructure. "It's a stone's throw from the existing mill building," Weekes said. "It sits right along the existing haul road to the Crescent pit and it sits between the past-producing Crescent and Afton pits. ... We believe there's still significant room to expand that resource, and because of the proximity to the mill building, we believe that this DM/Audra area is going to be very important as we move forward in production in the camp."

Rainbow is the only area of the three that doesn't have a past-producing open pit. "The Rainbow Zone sits within a poorly-explored 2 kilometer- by 1 kilometer-long IP chargeability anomaly; we're going to do a bunch more work on that in 2007," Weekes said. "The resource is open, and like just about all of our zones, has very high grade copper-gold mineralization at depth. ... certainly the potential of a possible underground target." Rainbow is not on an existing haul road, but it is less than 2 kilometers from the Ajax haul road.

Ajax is the area that Abacus is most excited about, according to Weekes. "The focus of Abacus's work in 2006 was Ajax West, where we intercepted our best grades and best widths," he said. The company completed 28,000 meters of drilling at Ajax in 2006. Past production was from two pits, and Abacus has also been drilling at Ajax East. Highlights from Ajax West included drill hole AW-06-034, which intersected 0.58 percent copper and 0.22 grams per ton of gold over 156 meters; and drill hole AW-06-039, which intersected 492 meters of 0.34 percent copper and 0.30 grams per ton of gold.

"We plan on a continued aggressive diamond drill program to expand the known reserves and to move inferred resources to measured and indicated categories, and the whole idea of this is to complete a feasibility study by the end of 2007," Weekes said. "We believe that this is a very aggressive timeline, but we believe it's achievable because of the existing infrastructure, the location, and the fact that we're looking at a simple open pit operation at each one of these deposits," he concluded. ●

● NORTHERN CANADA

# Miners serious about indigenous rights

*Past legacy created climate of mistrust but new approaches are proving fruitful for companies and aboriginals across the nation*

By SARAH HURST
*For Mining News*



Senior management and members of the board of directors of Polaris Minerals celebrate the beginning of construction of the Orca quarry, in the Big House of the Kwakiutl First Nation in Fort Rupert.

Miners in the far north can no longer trample on the rights of indigenous residents as some did in the past. Any company operating on or near aboriginal land must work closely with local communities, whether ownership issues have been decided, as in Alaska, or are still to be resolved, as in much of Canada. Political leaders and miners discussed the question of how to win community support for projects at the Mineral Exploration Roundup in Vancouver Jan. 29.

"How do we address the historical gaps that have separated aboriginal peoples from the rest of society for so many years, the numbers that we've become all too familiar with around education, health, ultimately mortality?" asked Mike de Jong, British Columbia's minister of aboriginal relations and reconciliation. "How are we going to embark on a new societal approach to ensuring that all British Columbians, all Canadians, are sharing in the abundance of wealth that this country enjoys?"

Premier Paul Okalik says Nunavut is open for business.

Policy toward aboriginals in British Columbia today is termed the New Relationship. Last year the provincial government allocated C$100 million to a New Relationship Trust that First Nations can use for land and resource management and social programs. "To get different results does involve doing things differently," de Jong said. "Reconciliation is an easy word to say, but saying it doesn't make it a fact. It becomes a fact over time."

### More outstanding issues for First Nations

"This New Relationship has been transforming the nature of how we work together. It has been built; it didn't happen overnight, but it has been built on the relationship between individuals," said Grand Chief Ed John, a lawyer from British Columbia. "Even though we are working together in this atmosphere of constructive relationship-building, there are still a lot more outstanding issues that we have to grapple with." Land use plans are needed for every square inch of the province so that First Nations know which lands are open to development and which are not, John added.

"First Nations are also legitimate players with legal interests in their traditional territories that exist now," John said. "They're not asserted rights, they're not asserted titles, they exist and they are real, and in a respectful environment industry needs to recognize and operate on that basis. ... From our side, from the First Nations side, we have every reason to be suspicious of industry; we have every reason to be suspicious of government. ... We don't want to be brought in at the last minute or as an afterthought." In cases heard by Canada's Supreme Court, government and industry invariably oppose First Nations, John said.

### Nunavut governed by Inuit

In contrast to British Columbia, the recently established territory of Nunavut is governed by the Inuit, who comprise about 85 percent of its population. Nunavut is already home to numerous mining projects and is always open for business, according to Premier Paul Okalik. "When it comes to Nunavut, all you have to do is listen to our invitation and take us up on it," he said. "As Inuit we have a history of adaptation when it comes to the introduction of new technologies in our communities and our territory."

Economic development is a priority for Nunavut, Okalik said. There is no capital tax in Nunavut, which is a significant incentive for the mining sector, he pointed out. Corporate taxes in Nunavut are among the lowest in the country and the territory also has Canada's lowest personal income tax rate, according to Okalik. In addition, Nunavut will rebate fuel taxes for off-road projects.

"The stakes are high and the potential is as vast as our territory," Okalik said. "Mining jobs are much more than shovels in the ground. There is the exploration and construction, camp management, administrative support, and eventually the decommissioning, reclamation and ongoing environmental monitoring." Rotational shifts at mining camps enable the Inuit to get out on their land and participate in traditional activities during their off-weeks, Okalik added. "For mine operators willing to invest in the local population, they will find a long-term workforce committed for the duration of the project," he said.

The opportunities created for young people are among the most positive benefits

*see* **RIGHTS** *page 15*

## Community relations are top priority at Orca quarry

On Vancouver Island in British Columbia, Vancouver-based Polaris Minerals is about to begin shipments from its Orca sand and gravel quarry. The products from Orca will go primarily to the California market, where demand for construction materials is apparently insatiable. Polaris has been building relationships with the 'Namgis First Nation and the Kwakiutl Band and the rewards have been huge, the company's president and CEO, Marco Romero, said at Roundup.

The 'Namgis have lived on northern Vancouver Island and adjacent islands for 10,000 years and currently number about 1,600 people. Their principal community is Alert Bay, on Cormorant Island. After lengthy negotiations with Polaris, the 'Namgis became equity partners in the Orca project, with a 12 percent share in it, and the chairman of Polaris subsidiary Orca is a 'Namgis member, George Speck.

"We, right from the start, right from the beginning, approached the 'Namgis and asked them for permission to explore on their territory," Romero said. "They were somewhat taken aback, because before we set foot on the ground we approached them, and that set the tone for what has become a remarkable partnership." Polaris went public in January 2006 and began construction of the Orca quarry two months later. The quarry is designed to produce 6 million metric tons of sand and gravel per year for over 25 years, making it the largest sand and gravel plant ever built in Canada.

### Orca developed in partnership with First Nations

"One thing that we committed ourselves right from the beginning was to work to very high standards," Romero said. "Our approach to dealing with community, dealing with First Nations, is only one example of that, but we decided to do quite a few things in a way that hopefully would gain us the support of the local communities, and particularly the local First Nations, and we put a tremendous amount of effort into that in the first few years of this business. We believe ultimately that we came up with a model which we don't know any other precedent for, and what it was, ultimately, was that we decided to develop this project in partnership with the local First Nations."

The Kwakiutl Band chose to participate in the Orca project through an impacts and benefits agreement. Orca happens to be located in an area where both the 'Namgis and the Kwakiutl have asserted territorial rights, so instead of waiting for them to work out their issues between themselves, Polaris worked hard to come to an accommodation with both groups, Romero said. The company's second quarry, the Eagle project on southern Vancouver Island, will also be developed in partnership with First Nations.

"Half of our employees are members of the Kwakiutl and

*see* **ORCA** *page 15*

*continued from page 14*

# ORCA

'Namgis First Nations, we also have said that we would try very hard to employ women," Romero said. "Right now over 40 percent of the people employed at site are women as well. ... Right from the early days we employed those First Nations to be part of every bit of work that we did, from the original exploration to the environmental studies." By openly sharing information with the First Nations, trust built gradually over time, Romero added.

A chief held a blessing ceremony at Orca before drilling began. Within two hours the first drill broke, but after replacing it everything went well and a very large deposit of high quality material was confirmed, Romero said. "One of the things that our partners insisted on very, very much is that we minimize our footprint around the site and minimize our impacts, and we committed ourselves very, very strongly to doing so, through the whole plans and design of the project, for example the buffer zone that we left between the Cluxewe River and ourselves exceeds by a lot the guidelines," he added.

### Progressive reclamation plan

Orca has a progressive reclamation plan so that at any given point there will only be a small exposed area of sand and gravel, while other areas will be replanted with native vegetation progressively. Polaris recorded every comment made about the project by people from the surrounding communities and ensured that they were all addressed before filing permit applications. Groups were brought in constantly to tour the site and Polaris insisted that the First Nations hire technical experts at the company's expense to review environmental studies and other documents. Eventually 57 separate agreements were signed with the 'Namgis.

"Some people have asked us, why are we doing all this? Well, First Nations have rights," Romero said. "These communities are closely attached to the land in so many parts of British Columbia. They were here before us and we can't bypass them, we can't bypass these rights, and there is a lot now of legal jurisprudence to strengthen these rights. ... We must work with them, and we felt it was the right thing to do. It was not only a legal obligation, we felt it was a moral and ethical one, but ultimately it was a pragmatic choice as well. If we could have their support we'd be better off."

Last November Polaris received the Mining Association of British Columbia's 2006 Mining and Sustainability award. In January the Prospectors & Developers Association of Canada announced that Polaris would receive an "e3" Environmental Excellence in Exploration award "for establishing excellent community relations and environmental practices."

The PDAC environmental award citation drew attention to the processing plant at Orca, which will feature a closed circuit water recycling system to ensure that no process water will be discharged into the environment. The system's filtering process eliminates the use of settling ponds, minimizes silt handling and cleanup costs, and allows for the silt to be used to beneficiate the soils during reclamation.

—SARAH HURST

COURTESY POLARIS MINERALS

**The Orca quarry on Vancouver Island, part-owned by the 'Namgis, is about to start production.**

*continued from page 14*

# RIGHTS

of mining, Okalik said. Mining projects give teenagers an incentive to finish high school and get the qualifications they need. "There is also the intangible benefit of what this does for the self-esteem of these workers, who know they're building a prosperous future for their community," the premier added.

### Canadian Aboriginal Minerals Association founded in 1992

Hans Matthews, a geologist and First Nations member who works for the Canadian Aboriginal Minerals Association, told Roundup that his organization was formed in 1992 by a group of people who wanted to see a change in the way that mining companies and aboriginal communities interacted. "Governments were settling very few land claims, mining companies were not getting projects approved, and the climate was that of confrontation and we thought that something had to be done," he said. "In the early days it was like pulling teeth to negotiate, however today ... it is the norm, but the implementation of agreements is a real challenge today," Matthews added.

Aboriginal communities often wonder why there is a sudden rush to develop a mineral deposit that has been there for a long time. "Given this lack of economic understanding, along with metal price cycles ups and downs, the urgency of a company to develop is wholly foreign to many communities," Matthews said. Some people remember previous development rushes when mining companies came in and left, never to be seen again. Aboriginals felt that they got a raw deal and this has created a climate of mistrust, according to Matthews.

"The mining industry is experiencing a period never seen before, with its very high nickel prices, for example, over $16, copper reaching over $3.50 and so on. ... But while the party goes on in one room, the truth is that aboriginal community prosperity may not be keeping pace," Matthews said. "Some communities are participating with companies, agreements are in place; some are only learning how to seek opportunities from the industry on their traditional lands; while many only have this desire to get involved. The reality is that many communities are struggling to respond to the fast and furious pace of the industry." ●

# Selkirk learning the ropes at Minto project

Vancouver-based Sherwood Copper is rapidly developing the Minto copper-gold project, the first new hard rock mine in the Yukon. Minto is on land belonging to the Selkirk First Nation, which numbers about 600 people, many of whom live in the nearby community of Pelly Crossing. Sherwood has worked hard to establish good relations with the Selkirk, the company's president and CEO, Stephen Quin, said at Roundup.

"You really have to be dealing with Selkirk right from the beginning on everything you do," Quin said. The Selkirk wanted to ensure that Sherwood's subsidiary, Minto Exploration, provided meaningful access to jobs and contracts, addressed the environmental and social risks of the project, and kept clear lines of communication open with them, he added.

"Minto Exploration's interest obviously is in ensuring that there is local support," Quin said. "With our very rapid development schedule, obviously we don't want things that are going to cause delays, that are going to impact that schedule, because that's very, very costly. We want to press the button to go; we want to get to the end of the race as fast as possible. We obviously want commercial certainty, we want to know what is the deal, when are the benefits going to come through. We don't want to continue with renegotiation or uncertainty coming through that process."

### Hiring, training, apprenticeship opportunities key

The key components of a cooperation agreement signed by Minto Exploration and the Selkirk are priority on hiring, training, apprenticeship opportunities for the Selkirk, access to contract opportunities and a direct payment of 0.5 percent net smelter return royalty on all production. For their part, the Selkirk committed to cooperate on project licensing, the environmental assessment process, provi-

*see* **SELKIRK** *page 16*

● YUKON

# One Yukon project enough for Pacifica

*Company to divide its assets, focusing on development of Selwyn and creating new junior that will explore in various jurisdictions*

**By SARAH HURST**
*For Mining News*

Following a positive preliminary assessment report for its Selwyn zinc-lead project in eastern Yukon, Vancouver-based Pacifica Resources announced that it planned to split into two new companies. If shareholders approve the reorganization, Pacifica's other exploration properties will be transferred to a company called Savant Exploration, while Pacifica will focus on Selwyn and rename itself Selwyn Resources.

This reorganization is similar to the one in December 2004 which created Pacifica and Yukon Zinc out of Expatriate Resources. Yukon Zinc has been developing the Wolverine project, and Harlan Meade is president and CEO of both Pacifica and Yukon Zinc. Pacifica intends to complete its plan of arrangement and distribute the majority of the Savant shares to its shareholders in June 2007. Exploration of Pacifica's properties in California, Nunavut, Ontario and Chile has been hampered by the allocation of most spending to Selwyn, the company said in a release Jan. 29.

COURTESY PACIFICA RESOURCES

Core shack at Pacifica's Selwyn project in the eastern Yukon.

### Selwyn consolidation of properties

Selwyn is a consolidation of various properties into a single major project covering 196 square kilometers. These include the Howard's Pass properties that Pacifica acquired from Placer Dome and Cygnus Mines in 2005. The preliminary assessment considers the development of a series of open pit operations mining 20,000 metric tons per day of zinc-lead mineralization to feed a standard flotation mill producing zinc and lead concentrates.

Current access to the Selwyn project site is by air or winter road. Pacifica proposes constructing a new 100-mile road following the Pelly River to meet the Robert Campbell Highway approximately 50 miles south of Ross River. The port at Stewart could be upgraded to provide the concentrate shipping capacity, but Skagway will also be considered. A coal-fired power plant for the mine has been assumed in the preliminary assessment, with coal to be supplied by the concentrate haulage fleet. Approximately 30 to 35 megawatts of power is required and the cost is estimated at C$0.114 per kilowatt hour.

COURTESY PACIFICA RESOURCES

Pacifica plans to spend C$25 million on exploration at Selwyn this year and to spin off its other projects to a new company.

### Permitting pegged at four years

The permitting process for Selwyn is expected to take about four years. Yukon Zinc already has a socioeconomic participation agreement with the Kaska Nation for its Wolverine project and a similar approach for completing an agreement with the Kaska and other First Nations is planned for Selwyn. The capital cost of the mine is estimated at C$685 million and the mine life would be 12.7 years.

Pacifica plans to spend C$25 million on exploration at Selwyn in 2007, including at least 40,000 meters of diamond drilling and extensive environmental and engineering studies. The drilling plan has two prime objectives: in-fill drilling to upgrade resources in the open pits targeted for initial development, and determining the extent and continuity of high-grade mineralization in the various zones over the 21 kilometers separating the XY and Anniv Central zones. Drilling of these deeper targets has the potential to define resources that would support early development of a bulk tonnage underground mine, complementing the open pit production, Pacifica said in a release Feb. 6. ●

*continued from page 15*

## SELKIRK

sion of access to the site and assistance with labor recruitment as well as communication and consultation.

"The Selkirk is generally supportive of the project, and essentially that's driven by, this is the only meaningful business opportunity available to the local community in the near term," Quin said. "There are obviously quite a few challenges to deal with and there are legacy issues in both the Yukon and locally; the Faro mine was abandoned with very substantial environmental ongoing liabilities. Selkirk First Nation was one of the affected communities or groups, so they obviously have a considerable amount of exposure to the issues related to abandoned mines that haven't been properly bonded," he added.

Another problem was that construction first began at Minto in the mid-1990s, but shut down at an early stage when metals prices collapsed. Expectations had been built up and then shattered, and that made it more of a challenge for Minto Exploration to re-establish trust with the Selkirk, according to Quin. Since that time there has been no industrial development in the area, so there are few people with the skills to work in construction or mining, he said. Anyone who does have the skills went to work elsewhere and has to be enticed back.

### Area doesn't have much industrial development

"Because of the lack of industrial development there's just essentially limited exposure to a private sector type of economy, and obviously camp life — this will be a drive-in, drive-out operation with our standard rotation, it'll be two weeks in, two weeks out — and that's not a common thing a lot of First Nations people have experienced in that area, so it requires a very dramatic cultural shift in thinking," Quin said. Nevertheless, there are now about 20 Selkirk working at Minto, including three who got their jobs back after failing drug and alcohol tests and going through rehabilitation.

Minto Exploration is accelerating the provision of educational trust funds for the Selkirk that it had promised to implement when production commenced: the company decided there was no reason to wait until then. Pelly Crossing is only 25 miles from the Minto site, so if more employees can come from there, then it will be much cheaper than driving or flying them in from a long distance, Quin noted. The mine can be a springboard for capacity-building for other mining projects and other industries in the Yukon, he added.

"We've had a number of successes, we do have quite a productive relationship in a number of areas," Quin said. "We've seen demonstrable success, support from Selkirk on permitting, which has shortened our permitting process. Remember they're the landowner, if they're going to the Yukon government and saying we support this, we've reviewed the technical information ... and we support this, then it's significantly reduced our process, for example to renew our Type A water license." A permit to expand the mill at Minto was also issued within three months, after the Selkirk provided written support to the regulators.

"Responsible companies really have to earn their social license to operate in an area," Quin said. "You've got to be open, fair, cooperative and reasonable. ... Don't go in with unrealistic expectations," he concluded.

**—SARAH HURST**

# North of 60 Mining News

Companies involved in Alaska and northwestern Canada's mining industry

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The Red Dog mine in northwest Alaska.

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● BRITISH COLUMBIA

# Tulsequah Chief owner floats barge idea

*Redfern Resources abandons controversial and costly plan to build a 100-mile road to support its mine near the Alaska border*

By SARAH HURST

*For Mining News*

A proposed mine just across the border from Juneau could use barges for the transport of equipment, supplies and mineral concentrate, eliminating the need for a new 100-mile road to Atlin. Vancouver-based Redfern Resources' surprising plans for Tulsequah Chief were published at the end of January in a feasibility study by Wardrop Engineering. In May 2005 Redfern had put the project on hold because of economic concerns, and in August 2006 environmental groups filed a lawsuit in Canada opposing the road.

The Tulsequah Chief property in British Columbia was first mined by Cominco in 1951-57. It contains a probable reserve of 5,378,788 metric tons grading 1.40 percent copper, 1.20 percent lead, 6.33 percent zinc, 2.59 grams per tonne gold and 93.69 grams per tonne silver, according to the feasibility study. Redfern would mine at a rate of 2,000 tons per day for an estimated mine life of eight years. The capital cost of the mine would be C$201.5 million and the payback period would be 29 months. The barge transportation system represents a capital cost reduction of C$46.5 million, plus a significant operating cost reduction.

For transportation Redfern hopes to use two air cushion barges towed by an amphibious tug that would operate year-round on the Taku River. There are likely to be some potential weather delays due to high winds, the feasibility study noted. All equipment and supplies would be shipped to site via Juneau during construction and operations.

One of the air cushion barges would also be used to haul mineral concentrate produced by the mine to Juneau for transshipment via an existing commercial ocean barge service to Skagway, where it would be ship-loaded for transport overseas. The disused Skagway Ore Terminal is already being retrofitted to handle concentrate from Sherwood Copper's Minto mine in the Yukon. The Taku River Tlingit and commercial fishermen from Juneau have expressed concerns about whether the air cushion barges would interfere with the river's salmon fishery.

### Air cushion barge hovers, but different than hovercraft

An air cushion barge is a barge that hovers on the water, but there are several differences between an ACB and a hovercraft, according to Redfern. Air cushion barges travel at a very slow speed and sit in the water at a depth of about 18 inches. They are quieter than hovercraft and generate minimal wake. Each of the two ACBs to be used by Tulsequah Chief would have a payload of 450 metric tons, and less than one trip per day carrying concentrate would be required. The ACBs would not be used for personnel transport: workers would be flown to site on charter planes.

"The Tulsequah mine will provide a significant economic benefit to the region and the province through job creation, workforce training, new business opportunities and taxes. Further, we believe that there is considerable opportunity to expand the reserve through additional exploration at the mine, at the Big Bull deposit, and elsewhere on the property," said Terry Chandler, Redfern's president and CEO.

The company believes that any necessary permitting amendments for the ACB alternative could be completed in three to six months and would not delay the project's development schedule, which envisages production starting in late 2008. A British Columbia Project Approval Certificate was issued in December 2002 and federal environmental assessment screening approval was issued in July 2005.

The State of Alaska's Large Mine Team in the Department of Natural Resources has said that it will review Tulsequah Chief project documentation to ensure that water treatment systems can realistically meet Canadian water quality standards at the mine site; tailings storage facilities are constructed to be geotechnically stable; groundwater water quality is protected and contingency pump-back systems are appropriately designed; and access roads are constructed and maintained in a manner that protects fish resources.

Tulsequah Chief would be an underground mine, with an existing drift to be used as the primary access route. The drift would be enlarged to accommodate modern diesel trackless equipment, according to the feasibility study. In the mill, gold concentrate will be separated using a gravity circuit and an on-site refinery will be used to produce gold bullion. Copper, lead and zinc concentrates will be produced and limestone will be added to the tailings to ensure there is no potential for acid generation. The limestone will be quarried, crushed and milled on site. ●

COURTESY REDFERN RESOURCES

Tulsequah Chief was first mined by Cominco in the 1950s and Redfern Resources has been trying to re-open it for the past several years.

COURTESY REDFERN RESOURCES

Helicopters in action at Redfern's Tulsequah Chief project in British Columbia.