

# PIPELINE

## No Second Chance, Warns Sharp

*Momentum must be maintained if pipeline project is to survive*



The Hon. Mitchell Sharp, Commissioner, discusses construction progress on the Eastern Leg near Olds, Alberta with an inspector from Foothills Pipe Lines (Alta.) Ltd.

The momentum gained by construction of the Western and Eastern Leg segments must be maintained if the Alaska Highway gas pipeline project is to survive, the Hon. Mitchell Sharp, Commissioner of the Northern Pipeline Agency, has warned.

Speaking on October 19 in New York, Sharp expressed relief over "the latest in the Alaska pipeline drama" — the submission to Congress by the Reagan Administration of the package of waiv-

ers to existing legislation to facilitate private financing of the northern segments of the project in both Canada and the United States. "I was very concerned, as I acknowledged publicly, that any prolonged delay could prove to be very dangerous insofar as moving ahead with the remainder of the project," he told his audience at a gathering hosted by the Canadian Consul General, Ken Taylor.

Sharp chose to direct his remarks to

the financial community, which will be involved in the intricate financial negotiations once the waiver package receives congressional approval. He said he sensed among certain quarters an attitude of "let's just put the whole project on hold for a few years," since the United States currently has all the gas it requires and, if necessary, can always look for more from Canada. This view has been reinforced by a belief that the Alaskan gas will be expensive initially and its marketing possibly impeded by further deregulation of gas prices.

"I sincerely hope, as a Canadian and a North American, that this kind of thinking does not prevail as the time for decision on this great joint project approaches," the Commissioner said. "My gut feeling is that there may be no second chance to put it all together again. Would a Canadian government be prepared to enter into another agreement to build a land bridge to carry Alaska gas to the lower 48 states if the present agreement turned out to be non-operative? How many private companies could be found who would be willing to try again?"

Any major project today requires a long lead time, continued the Commissioner, and an element of uncertainty as to what the future holds is inevitable. "Despite that uncertainty, there is no way to avoid developing and implementing plans for such projects that will only come to fruition many years ahead on the basis of the best judgement which can be made in light of present-day knowledge — imperfect and all as it may be."

Sharp reminded his listeners that in 1977 the governments of Canada and

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## No second chance, warns Sharp

the United States were sufficiently concerned about future energy supplies to enter into an agreement to facilitate building the Alaska Highway gas pipeline. "I ask myself these questions: is the outlook for energy supplies better now than it was when this historic agreement was entered into? Is there less need for Alaska gas or less need for a lateral pipeline to tap Canadian gas supplies from the mouth of the Mackenzie River or the Beaufort Sea? Will Alaska gas be less competitive than it was in 1977? Is the national security of the United States and Canada less threatened by dependence upon petroleum from politically volatile areas of the world now than it was in 1977?"

*" . . . largest single source of additional energy available . . . "*

Although Canada and the U.S. have a surplus of natural gas which did not exist in 1977, we cannot afford to be complacent, Sharp warned. "To be specific, it seems incredible to me that the United States, and here I include the government, the industries and the people of your great country, could conceivably take the position that it is not of great importance whether or when you gain access to the 26 trillion cubic feet of natural gas that is available for shipment from Prudhoe Bay — and more may be discovered — the largest single source of additional energy available to you for years to come."

With the price of oil now more than double the 1977 price of \$15 a barrel, Alaskan gas is probably more competitive today, maintained Sharp. Marketing problems in the early years of delivery, coupled with the effects of further gas deregulation were foreseen, he explained, by providing for the price of Alaska gas to be rolled in with other supplies. "Because of a reducing rate base over the lifetime of this project, Alaska gas will probably be one of the most marketable of all energy supplies available in the lower 48 states, even making optimistic assumptions about the course of future inflation," Sharp remarked.

The economic and national security interests of Canada and especially the United States are at stake, he continued, unless we further reduce our depend-

ency on foreign energy supplies, particularly from the Middle East, and increase our own self-reliance. Besides the short-term economic stimulus, the pipeline will provide Canadians with access to existing reserves in the Mackenzie Delta and possibly to additional reserves that will be established in the Beaufort Sea, Sharp added. "Perhaps overriding everything else, because the fate of our two nations and of our economies is closely intertwined, we in Canada have a vital interest in seeing that your country has ample and secure sources of domestic energy supplies."

There is great risk in not moving ahead expeditiously with the pipeline project, stressed Sharp. "From a Canadian perspective this takes on added importance from the point of view of the scheduling of construction. We have either already in progress or on the drawing boards a number of large energy projects that are due to be completed during the present decade. To avoid an intolerable strain on physical and human resources, and to keep costs under control, it is

vital that construction of the remaining segment of the Alaska Highway gas pipeline in Canada be phased to avoid undue overlapping with these other domestic projects.

### *Financing difficult task*

Financing construction of the remaining sections, primarily the Alaskan portion of the system, is the difficult task which lies ahead, Sharp reminded his audience. "Even with the heavy involvement of 10 of the major gas transmission companies in North America—including TransCanada PipeLines as a member of the Alaska consortium — and three of the leading petroleum producers, the raising of the necessary investment capital will not be easy. While the challenge may be very great, so is the cost of failure in terms of the economic and security interests that are at stake and, beyond that, the public's confidence in the ability of private enterprise to serve those critical national interests," he concluded.

## *U.S. Congressional Committees Study Waiver Package*

Congressional committees concluded hearings on November 9 into the package of legislative waivers designed to facilitate private financing of the Alaskan segment of the Alaska Highway gas pipeline.

Introduced October 15 to Congress by President Reagan, the waiver package would lift certain restrictions of the 1977 *Alaska Natural Gas Pipeline Act*, which authorized construction of the pipeline. The proposed waivers would allow the gas producers — led by Exxon Corporation, Atlantic Richfield Co. and Standard Oil Co. of Ohio (SOHIO) — to share in the equity of the Alaskan portion of the system, including the \$6 billion (U.S.) Prudhoe Bay gas conditioning plant.

Another waiver would provide for the contingency of early billing before gas was flowing, in the event that one portion of the pipeline was completed and the other portions of the system were not yet ready to go into operation. This

waiver provision would come into effect only after a completion target date established by the U.S. regulatory authorities. For the purposes of this waiver, the pipeline would be broken down into three sections — the Alaskan segment, the gas conditioning plant and the Canadian segment. If either the Alaskan segment or the conditioning plant are completed ahead of the Canadian segment, the waiver would permit the partial cost of service (for operations, maintenance and debt service) to be passed on to the U.S. consumer. If the Canadian segment is completed before the entire system is ready to go into operation, the Canadian sponsor would be able to begin recovering the full "cost-of-service", including a return on equity.

The waiver package must gain approval without amendment from both Houses of Congress by December 19, within 60 calendar days of its introduction by the President.

# Crossing the South Saskatchewan River

It took a full day and a half, but by 12 noon, Saturday, October 10, the "pull" of the 250 m (820 ft.)-long portion of the Alaska Highway gas pipeline's Eastern Leg across the South Saskatchewan River in eastern Alberta was completed. Approximately 100 tonnes of 1,067 mm (42 in.)-diameter steel pipe, covered with a 15 cm (six in.) coating of concrete weighing 278 tonnes, were slowly submerged from the west bank into the riverbed trench by sideboom tractors. At the same time, a D8 bulldozer anchored on the opposite shore hauled the pipe across the water with cables.

"The actual pull was done in two phases, as is the norm with a river crossing of this width," explains Keith MacDonald, the Northern Pipeline Agency's Regional Manager of Surveillance. "It started with two sections of pipe, laying side by side on the west bank of the river. One section was pulled about two thirds of the way across and lined up and welded to the second section. The weld was then checked by x-ray, proven satisfactory and covered with concrete, which was allowed to harden overnight. The final pull of the two sections together took place the next day."

As a specialist in pipeline water crossing construction, MacDonald has supervised projects in the mid-western United States, South America, British Columbia and Yukon. These include the 2,300 m (7,600 ft.) crossing of Okanagan Lake, B.C., by a 20 cm (eight in.)-diameter gas pipeline in 1977 and the 549 m (1,800 ft.) crossing of the Yukon River near Whitehorse by a 610 mm (24 in.) water line in 1978.

MacDonald recalls how a number of dignitaries were on-site to view the final pull across the Yukon River. "We had everything rigged up and began the pull on schedule, when a cable snapped. Of course we repaired it and successfully completed the crossing, but not until the next day and by then all our spectators had gone!"

Although the South Saskatchewan River crossing was a fairly straightforward procedure, MacDonald says several months of preparation were involved in grading the steep riverbank approaches and installing the pipe to within 30 m (98 ft.) of the water's edge. Foothills Pipe Lines (Alta.) Ltd. assigned the approach work and river crossing as a contract separate from the rest



**As sideboom tractors lower the first section of pipe into the water, a bulldozer anchored on the opposite shore pulls the pipe with cables.**

of the Eastern Leg job to O.J. Pipelines Ltd. of Edmonton. "The contractor completed the grading and pipe-laying work by the end of July, but waited until October to execute the crossing because of high water levels during the summer and early fall," notes MacDonald.

Digging the trench in the riverbed began in late September and took two weeks, using a dragline with a bucket attached by cables which could be thrown about 46 m (150 ft.) into the water and drawn back to the machine. MacDonald explains this allowed the contractor to excavate the three m (11 ft.)-deep channel in the middle of the river from shallower points on both sides.

"The depth and width of the ditch for an underwater pipeline crossing, depends on the composition of the riverbed," MacDonald continues. The floor of the South Saskatchewan River at the crossing consists mainly of large pieces of gravel on the west side and clay deposits on the east side, where the erosive force of the water is stronger. The ditch was dug five m (17 ft.) deep to accommodate at least two m (6.5 ft.) of cover over the pipe. Where clay predominates near the east bank, the trench walls were cut almost vertically, with a width of about six m (20 ft.) at the top.

The less stable gravel material closer to the west bank was dug at a more gradual slope with about 12 m (40 ft.) of distance between the ditch walls.

Once the ditch was in place and checked for stability by on-site scuba divers, the cables were hooked onto the pipe and strung across the river directly above the centre line of the ditch. "The pull was delayed a day or two because the ditch sluffed in slightly," reports MacDonald, "but that's not serious nor unusual. Worse things could have happened such as a cable snapping or a machine breaking down. Also, there wasn't a current of any consequence to contend with."

For river crossings further north such as the Yukon and Liard Rivers, the water is much swifter and a wider ditch will be required to keep the walls intact, MacDonald points out. The 10 km (six mi.) crossing of Kluane Lake in Yukon will be another major construction job requiring a great deal of engineering and environmental expertise, he adds. "Ditching and installation will have to be done off a barge."

The location of the South Saskatchewan River crossing follows the existing pipeline right-of-way of NOVA, AN AL-

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## Crossing the South Saskatchewan River



The two river sections of pipe are welded together on the west bank before the final pull.



View from the west bank of the South Saskatchewan River. The pull is almost complete as the end of the pipe attached to the cables surfaces on the opposite shore.

BERTA CORPORATION, formerly The Alberta Gas Trunk Line Company Limited (AGTL). The company installed its first pipeline across the South Saskatchewan River in 1957 as an aerial crossing — a 914 mm (36 in.) - diameter line supported by a bridge. Additional loops to the AGTL system, all within a span of one km (0.6 mi), have been pulled across the river in the conventional underwater manner. However, the Alaska gas pipeline involves the largest diameter of pipe — 1,067 mm (42 in.) - laid in the river to date.

By October 26, the crew had back-filled the trench and tied the concrete-coated river pipeline section into the dry land portions which were installed this summer. At a later date, O.J. Pipeline's work will be connected on the east side to the segment of the Eastern Leg completed by Majestic Wiley Contractors Limited of Edmonton, which continues through southwestern Saskatchewan to the Canada-United States border near Monchy. The section to link up with O.J. Pipeline's work on the west side of the river is scheduled for construction next summer.

### *Fish Window Affects Construction Scheduling*

To minimize the risk of smothering fish eggs or blocking fish migration by excess silt produced by in-stream construction activity, a pipeline crossing of a watercourse should be built during a fish window. This is the time period within which fish are least sensitive to the harmful effects of silt, such as after the eggs have incubated and before spawning migration begins.

Walleye, sauger, northern pike, gold-eye and lake sturgeon are known to exist in the South Saskatchewan River in the area of the pipeline crossing. The Alberta Fish and Wildlife authorities chose July 1 to March 15 as the allowable time for in-stream activity to take place, because these species are spring spawners. The fish window provided for the crossing of the Red Deer River, also in Alberta, was only two months, between July 1 and September 1, because the mountain whitefish which inhabit the river spawn during the fall. The Red Deer River crossing of the pipeline's Eastern Leg was ditched and the pipe pulled through in late August.



# Profile — Les Williams, Assistant Administrator, Scheduling and Regulatory

*Expertise in overall project management*



**Les Williams, Assistant Administrator, Scheduling and Regulatory**

For Les Williams, joining the Northern Pipeline Agency in 1979 as an Assistant Administrator, responsible for Scheduling and Regulatory, was like attending a class reunion with at least half a dozen other senior level Agency people whose careers had overlapped at various times during the years. "Although we came from all over — both from the private and public sectors — many of us had been involved with the northern gas pipeline (now the Alaska Highway pipeline project) since it was first conceived," Saskatchewan-born Williams explains.

As an engineering consultant specializing in project planning, management and cost control, Williams worked almost continuously between 1968 and 1976 on the preparation of Canadian Arctic Gas Pipeline Company's application to route the pipeline through the Mackenzie River valley. Although Canadian Arctic's proposal lost out in 1977 to the bid by Foothills Pipe Lines (Yukon) Ltd. to follow the Alaska Highway route, Williams notes that commonly-shared insights grew from the decade of study and public inquiry process into the northern pipeline.

"Everyone concerned knew there would be an unprecedented amount of government regulation and direction, no matter which company received the certificate to build the pipeline," Williams points out. "The idea of a 'Northern Pipeline Agency' as a single government authority to facilitate and regulate planning and construction seemed the most practical solution, and was advocated by the companies concerned," he adds.

Williams' involvement with the pipeline industry in Canada goes back 25 years, following graduation from the University of Saskatchewan in civil engineering in 1948 and nine years with the engineering division of Canadian Pacific Railway. During the late 1950s and '60s, he supervised a number of projects throughout western Canada, including Pacific Petroleum's small-diameter gas products pipeline between Burstall, Saskatchewan, and Winnipeg, Manitoba, and the field gathering system for Husky Oil's heavy oil transportation near Lloydminster, Saskatchewan.

"This was the first time heavy oils were successfully moved on a significant scale, by a process of heating and blending with condensate—a by-product of natural gas production," he explains. "We started the system in 1963 and engineered Husky's first pipeline from Lloydminster to Hardisty, Alberta, where it joins Interprovincial Pipeline's Edmonton to Sarnia line. By 1967, the Husky pipeline had been looped about three times to increase the capacity."

During 1978-79 and prior to his appointment with the Agency, Williams managed a high impact welding test program for Canadian Industries Limited, experimenting with the use of explosives to weld pipe. "We may see this development applied to large-diameter pipelining in years to come," he adds.

The pipeline industry in Canada is no longer dominated by Americans, notes Williams. "When things began to roll in Canada during the late '50s, most of the expertise came from the States. Now you'll find Canadians are every bit as experienced and innovative in the engineering and construction of large-

diameter pipeline."

Williams' expertise in overall project management lends itself well to his position as head of the Agency's Scheduling and Regulatory group. "We're sort of a mish-mash of everything," he remarks. "We oversee the Foothills companies' land acquisition and right-of-way activities, as well as project scheduling, cost estimates and cost control performance." The economics of any project, let alone one of this magnitude, are fundamental, says Williams. "The biggest challenge is to make sure the company brings each section of the pipeline in on schedule and within budget."

Much of Williams' work at the Agency has involved close liaison with National Energy Board (NEB) staff members in analysing Foothills' final design cost estimates for construction of the Western and Eastern Leg facilities of the pipeline. When compared with the actual costs, these estimates will be used by the NEB to determine the rates that Foothills will be allowed to charge for transportation of the gas and the rate of return on their investment. "The rate-setting process may seem detailed and technical," admits Williams, "however, it's necessary, especially as it affects the price American consumers will pay for gas."

Having come to the Agency from private industry, Williams suggests decision-making within a government/regulatory context is handled with a greater degree of caution. "You have to be as close to correct as possible, so it takes more study and a longer time. In industry, you're mainly responsible to your client or shareholder, whereas in government you must consider the consequences of your decision for the taxpayer."

Williams sees the Agency's role as a mirror for major development projects in Canada. "It's worthwhile to periodically stand back and look at where we have been, where we are going and how we can improve in all the aspects combined — environmental, social, economic and technical."

# News in Brief

By mid-November, the 1981 construction program on the Canadian Eastern Leg of the pipeline in Alberta and Saskatchewan had been completed on schedule. Since last June, 425 km (264 mi.) of the total 635 km (394 mi.) comprising the Eastern Leg have been built between James River Junction, north of Calgary, and the Canada-United States border near Monchy, Saskatchewan. The remaining portions in Alberta scheduled for 1982 construction, beginning in July of that year, include 144 km (89 mi.) between Hicklon Lake and Gem and 66 km (41 mi.) between Jenner and the South Saskatchewan River.

The Northern Pipeline Agency will maintain a field surveillance office in Medicine Hat to supervise construction throughout the winter of the compressor stations at Jenner, Alberta, and Piapot, Richmond and Monchy, Saskatchewan, and the Monchy meter station.

Construction activity on the 1,821 km (1,132 mi.) U.S. Eastern Leg is scheduled to shut down in mid-December and will resume next spring.

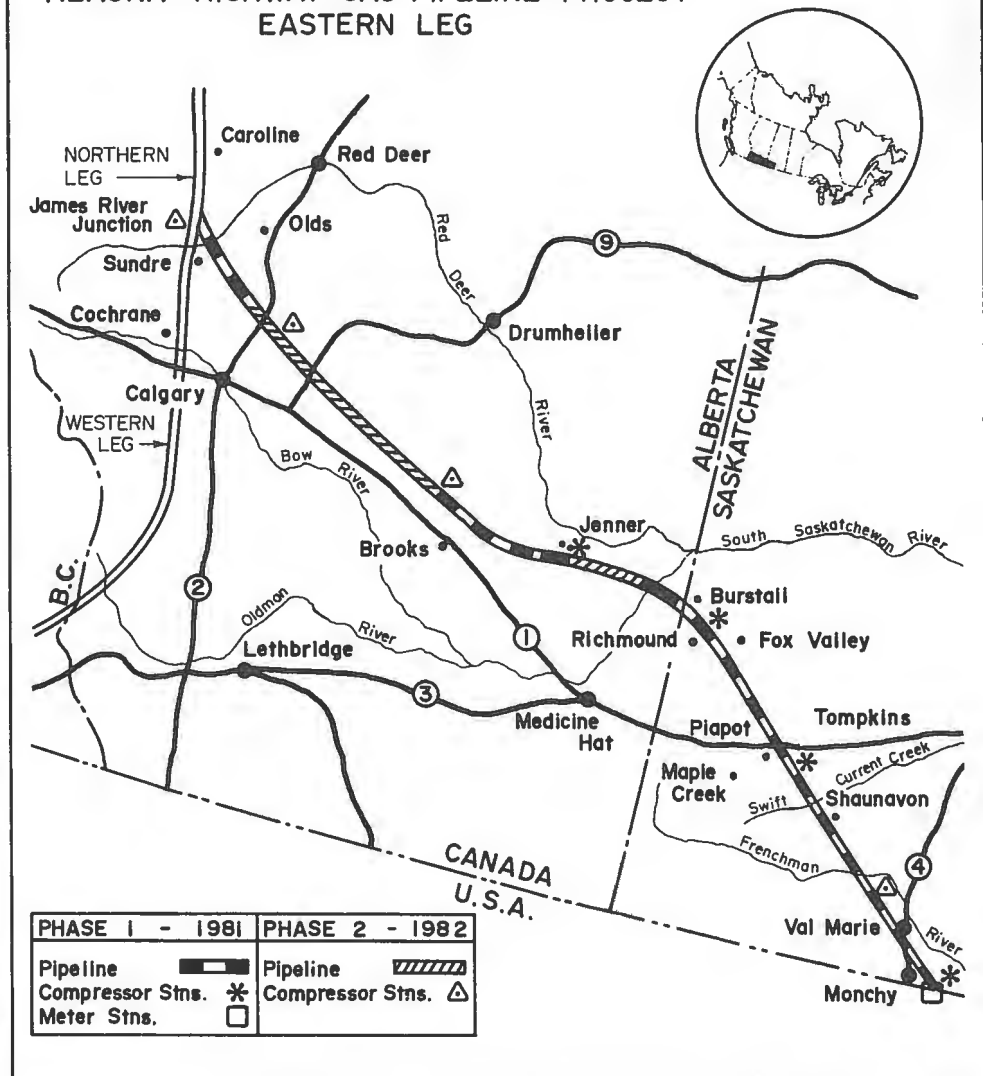
**Foothills Pipe Lines (North B.C.) Ltd.** has opened an office in Fort Nelson, B.C., under the direction of Gordon McKenzie, to provide information to local residents on the Alaska Highway Gas Pipeline Project. This includes details on training programs, job and business opportunities and plans for transportation of pipe and telecommunications services relating to the project.

**The Northern British Columbia Advisory Council** has elected Don Edwards of Fort Nelson as Chairman and George Miller of Lower Post as Vice-Chairman.

Mr. Edwards, a businessman, is a Director of the Peace River-Liard Regional Board and an alderman for the village of Fort Nelson. He replaces Patrick Walsh, who served as Chairman of the Council during its first year and recently resigned to take up the position of Commissioner and Chief Executive Officer of Tumbler Ridge, B.C.

Mr. Miller is a board member of the United Natives Nation and an active community leader of Lower Post. He was appointed Vice-Chairman by the federal cabinet when the Council was created in September, 1980.

## ALASKA HIGHWAY GAS PIPELINE PROJECT EASTERN LEG



## Pipeline

The Northern Pipeline Agency was created by Parliament in April, 1978 to oversee the planning and construction of the Alaska Highway gas pipeline project in Canada. Enquiries or suggestions regarding the Agency's publication *Pipeline* are welcome and may be directed to:

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