

The Corridor Concept

The Corridor Concept and Cumulative Impact

The concept of a pipeline corridor from the North was first enunciated by the Government of Canada in the 1970 Pipeline Guidelines. In 1972, these Guidelines were expanded. The Expanded Guidelines for Northern Pipelines (to which I shall refer as the "Pipeline Guidelines") were tabled in the House of Commons in June 1972, and they form the cornerstone of Canadian policy with regard to the construction of northern pipelines. The Inquiry is bound by Order-in-Council, P.C. 1974-641 March 21, 1974, under which it was established, to consider the proposals made by the pipeline companies to meet the specific environmental and social concerns set out in the Pipeline Guidelines.

The significance of the corridor concept to this Inquiry relates to the consideration of impact and cumulative impact. The Pipeline Guidelines assume that, if a gas pipeline is built, an oil pipeline will probably follow it, and they call for examination of the proposed gas pipeline from the point of view of cumulative impact. We must consider then, not only the impact of a gas pipeline, but also the impact of an oil pipeline — in sum, the impact of a transportation corridor for two energy systems.

The government's corridor policy is plainly spelled out in the Pipeline Guidelines:

In view of the influence of the first trunk pipeline in shaping the transportation corridor system and in moulding the environmental and social future of the region, any applicant to build a first trunk pipeline within any segment of the corridor system outlined in 1. above must provide with [its] application:

- i) assessment of the suitability of the applicant's route for nearby routing of the other pipeline, in terms of the environmental-social and terrain-engineering consequences of the other pipeline and the combined effect of the two pipelines: . . .
- ii) assessment of the environmental-social impact of both pipelines on nearby settlements or nearby existing or proposed transportation systems. . . [p. 10]

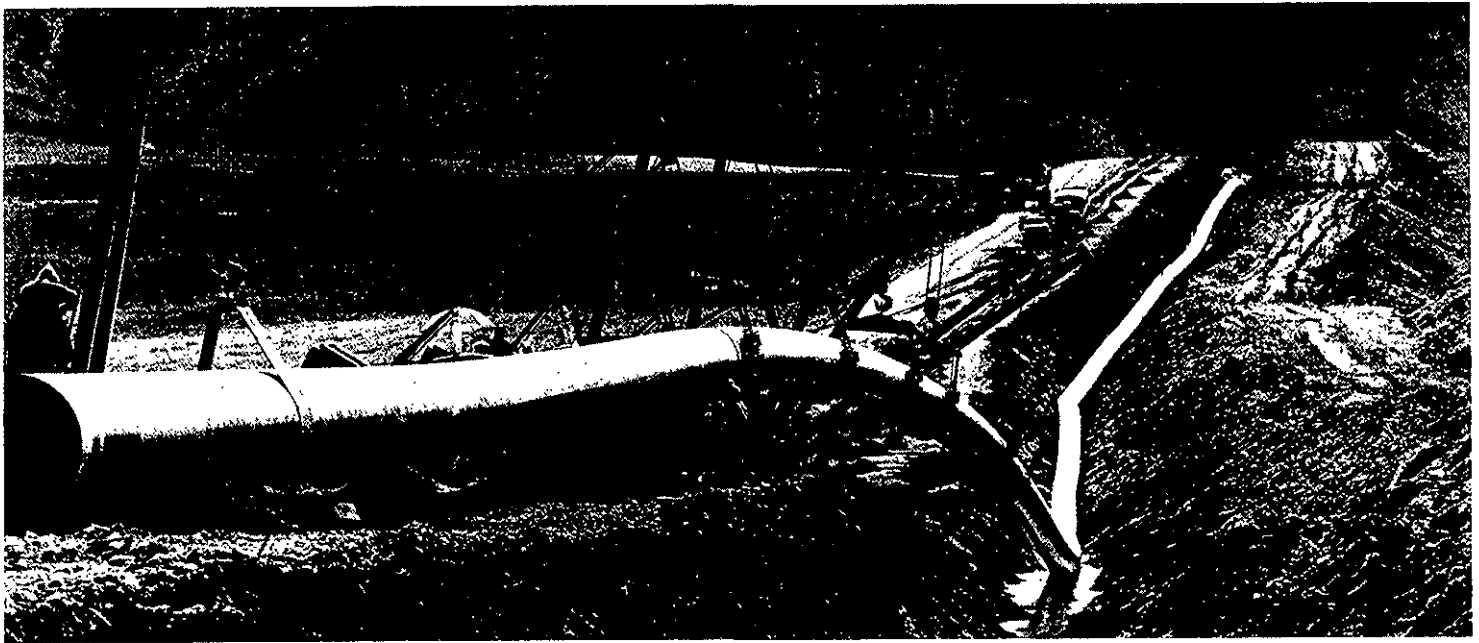
The assumption in 1970 was that an oil pipeline would be built first, and a gas pipeline would be likely to follow it; ever since the Pipeline Guidelines were issued in 1972, the assumption has been that a gas pipeline would come first and that an oil pipeline would be likely to follow it. Now we have before us proposals by Arctic Gas and Foothills to build a gas pipeline. The influence of a gas pipeline on the development of an energy corridor and in moulding the social, economic and environmental future of the North will be enormous. The Pipeline Guidelines call for a consideration of the environmental and social impact of a gas pipeline and an oil pipeline, as well as of the combined impact of the construction of both pipelines along the corridor. That policy ramifies throughout the Inquiry's consideration of the environmental and social issues that arise along the whole route. However, the corridor will not be simply a corridor for gas and oil pipelines. The Pipeline Guidelines envisage that the corridor may eventually include roads, a railroad, hydro-electric transmission lines and telecommunications facilities.

There are real limits to our capacity to forecast the impact of such a corridor. The Pipeline Guidelines are principally concerned with the impact that gas and oil pipelines will have in the North. The Inquiry has, therefore, largely limited itself to a consideration of the impact of these energy

transportation systems. But sometimes it has been necessary to consider the impact of pipelines in relation to other transportation systems. For instance, what if a haul road had to be built along the Arctic Coastal Plain of the Northern Yukon? Or to what extent will the capacity of the existing fleet of tugs and barges on the Mackenzie River have to be augmented? Or to what extent will hunting from the Dempster Highway have to be restricted to enable the recommendations of this Inquiry to be carried out? We cannot make an intelligent assessment of the impact of a gas pipeline unless we do so in the light of the cumulative impact of the corridor.

Of course, the gas pipeline itself will be a multi-stage project involving considerations of cumulative impact. The gas pipelines proposed by Arctic Gas and by Foothills can be expected to be looped. Looping is the process of progressively increasing the amount of gas that can be transported by the pipeline system; a second (or third) pipeline is built beside the first in sections or loops from one compressor station to the next. This means that construction along the gas pipeline right-of-way can be an ongoing or repetitive process and can involve cumulative impacts over and above those resulting from the project that was originally proposed.

The importance of considering the impact of a gas pipeline in the light of cumulative impact along the corridor is obvious. This importance can be illustrated by reference to gravel, which is in short supply in the North. Arctic Gas estimate that the gas pipeline will require 30 million cubic yards of gravel and other borrow materials within Canada and North of 60. Mackenzie Valley Pipeline Research Limited estimated the gravel requirements for an oil pipeline at 42 million



cubic yards. It would be foolish to consider the impact of the borrow requirements of a gas pipeline without taking into account the gravel requirements of an oil pipeline, as well as those of other regional and local projects. Substantial amounts of borrow materials will be required for gas plants and gas-gathering systems in the Mackenzie Delta, for the completion of the Mackenzie Highway and the Dempster Highway, and for airports, not to mention the needs of communities along the route. Gravel provides a quite straightforward example of cumulative impact. There are many other examples, some of them by no means as straightforward, that I shall be dealing with in this report.

The Northern Yukon Corridor and the Mackenzie Valley Corridor

It should be borne in mind that there are two proposed corridors: one across the Northern Yukon and another along the Mackenzie Valley. The following passage from the Pipeline Guidelines makes this plain:

The Government of Canada is prepared to receive and review applications to construct one trunk oil pipeline and/or one trunk gas pipeline within the following broad "corridors":

- i) Along the Mackenzie Valley region (in a broad sense) from the Arctic coast to the provincial [Alberta] boundary;
- ii) Across the northern part of the Yukon Territory either adjacent to the Arctic coast or through the northern interior region from the boundary of Alaska to the general vicinity of Fort McPherson, and thus to join the Mackenzie "corridor"; ... [p. 9]

Arctic Gas propose to build a pipeline from Alaska that would use the corridor across the Northern Yukon as well as the corridor along the Mackenzie Valley. Foothills propose to build a pipeline that would use only the corridor along the Mackenzie Valley.

Arctic Gas propose to transport only Alaskan gas in the corridor across the Northern Yukon, and to transport both Alaskan and Canadian gas in the Mackenzie Valley corridor. Under the Foothills proposal, the Mackenzie Valley corridor would be used to carry only Canadian gas.

Since 1972, as mentioned above, the Government of Canada has assumed that a gas pipeline along either of these corridors would probably be followed by an oil pipeline. That assumption is a sound one: once a gas pipeline is built across the Northern Yukon, there will be every reason for an oil pipeline carrying American oil to follow the same route. You may ask, is not the trans-Alaska pipeline to carry American oil to the Lower 48? The Alyeska pipeline was built to deliver oil to the western states, but the United States still has severe shortages of oil in the midwest and the east. And there are great petroleum reserves in northern Alaska, especially in Naval Petroleum Reserve No. 4 lying to the west of Prudhoe Bay. The urgency of bringing oil from northern Alaska to the markets in the Lower 48 that need it most is obvious. If a gas pipeline and energy corridor were already in place across the Northern Yukon and along the Mackenzie Valley, it is quite likely this corridor would be the route of choice.

Once a gas pipeline is built along the Mackenzie Valley, it is likely that in the future an oil pipeline will follow. Oil has in fact been found in the Mackenzie Delta region. It is said that discoveries of oil in the

Mackenzie Delta and the Beaufort Sea do not justify an oil pipeline today. Nonetheless, while the proven reserves of oil in the Mackenzie Delta region have not yet reached threshold levels, they may do so in time. In any event, it is obvious that if present or future exploration programs reveal large reserves of oil under the Beaufort Sea, the call for an oil pipeline from the Delta to the mid-continent will be made once again.

I think all of this demonstrates the wisdom of the Pipeline Guidelines, which insist that there should be an examination of the impact of an oil pipeline along with the gas pipeline. Any attempt to dismember the policy and to assess the impacts piecemeal, along either the Northern Yukon corridor or the Mackenzie Valley corridor, should be resisted.

The United States' Interest in the Corridor

The Arctic Gas pipeline, if it is built, would provide a land bridge for the delivery of Alaskan gas across Canada to the Lower 48. The implications of this prospect, from the point of view of Canadian policy in the North, should be borne in mind.

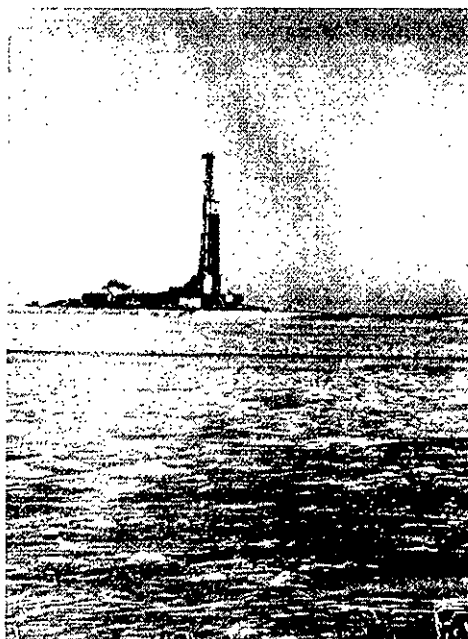
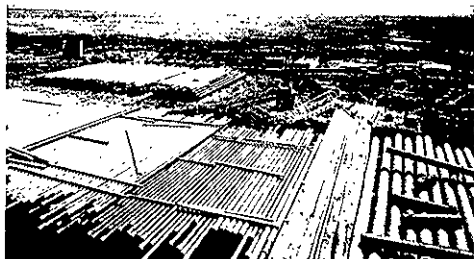
The corridor across the Northern Yukon will be an exclusively American energy corridor. The Mackenzie Valley corridor, under the Arctic Gas proposal, will be an American energy corridor as much as it is a Canadian energy corridor. The United States will have an interest in the scheduling of pipeline construction in Canada and, when the pipeline is built, in seeing that it remains safe and secure, because it will be carrying Alaskan gas in bond to the Lower 48. It will be an energy lifeline for the United States,

*Trans-Alaska pipeline and gravel haul road.
Sideboom tractors lower pipe into ditch. (Alyeska)*

Stockpile of drill pipe. (NFB—McNeill)

Drill rig in the Delta. (Arctic Gas)

*Mackenzie Highway right-of-way beside
Mackenzie River. (J. Inglis)*



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extending across the Northern Yukon, across the Mackenzie Delta, along the Mackenzie Valley, and then through Alberta, Saskatchewan and British Columbia to the Lower 48. It will supply gas to a complex of industries and urban centres in the United States. The Americans will be dependent on the continuous supply of gas, and the gas being transported from Alaska will be their own gas. Moreover, the United States wants the pipeline to begin to deliver that gas as soon as possible.

There are, of course, pipelines that cross United States territory and carry oil and gas to Canadian markets: the Interprovincial pipeline, which delivers western oil to Ontario; the Portland-Montreal pipeline, which delivers offshore oil to Quebec; and the Great Lakes Transmission Company pipeline, which delivers gas to Ontario. All of them pass through the United States. But these connections cannot be compared in magnitude or impact to the Arctic Gas proposal. They are not pipelines reaching some 2,000 miles from a distant frontier.

The consequences of such American interest in the pipeline are of special concern to the Inquiry. The impact of the pipeline, so far as northern peoples and the northern environment is concerned, will be largely within Canada (the line from Prudhoe Bay to the Alaska-Yukon border is only 200 miles long, whereas the line from the Alaska-Yukon boundary to the Northwest

Territories-Alberta border is 1,000 miles long). The native people's concern over when a pipeline is built, the environmental concern over where it should be built, and the stipulations for protecting the people and the environment apply largely in Canada. The United States cannot be expected to be as concerned as Canada with the seriousness of the social and environmental impact of the pipeline along its route. This difference, coupled with the Americans' rather more urgent need of gas, might result in pressure to complete the pipeline without due regard to the social and environmental concerns in Canada. The risk is in Canada. The urgency is in the United States.

A pipeline 2,200 miles long (in Canada) is a highly vulnerable artery. What measures might have to be taken to forestall an interruption of delivery — an interruption that would affect vital Canadian interests, but even more tellingly, vital American interests? There may be real possibilities for misunderstanding and tension between our two countries, notwithstanding our long history of good relations. These considerations deserve the attention of the Government of the United States as well as of the Government of Canada. It may be that they are not at all daunting. But they should still not be overlooked.

A treaty between Canada and the United States will not cover all possibilities. It will, of course, define the rights of our two

governments with regard to the pipeline and to the gas being transported in that pipeline. And it will establish the ground rules for the transportation of Alaskan gas across Canada to the United States. It cannot do more. I say this because a treaty, although it will regulate the conduct of our two governments, will not necessarily regulate the conduct of the two countries' citizens.

The implications for our relations with the United States of the building and maintenance of the proposed gas transmission system deserve careful consideration by all Canadians. We are not simply considering a proposal to build a pipeline on an isolated frontier. We are considering, in the Arctic Gas proposal, the establishment of an international energy corridor that will cross some 2,200 miles of Canadian territory, opening up wilderness areas that are among the most important wildlife habitat in North America. It will cross lands that are claimed by Canada's native people, a region where the struggle for a new social and economic order and political responsibility is taking place.

It seems to me the question of whether or not there should be a corridor to carry vital energy supplies from Alaska through the heartland of Canada to the Lower 48, is at the threshold of the decision-making process. If Canadians decide that there is to be such a corridor, then we must also consider when it should be established and what route it should follow. These are questions Canadians must decide for themselves.



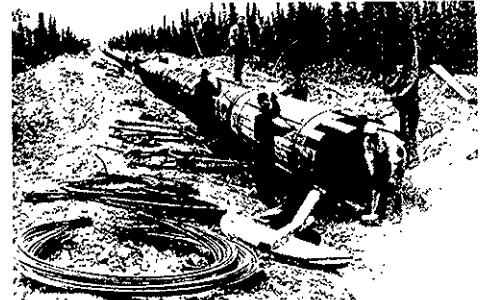
Early northern development: clockwise from top:
Dawson City at the height of the Klondike Gold
Rush, July 4, 1899.

A wood-stave pipe used to carry water to Klondike
placer mines.

Plank road on the ice across the Peace River, part of
the Alaska Highway, 1942.

US soldiers lay logs for corduroy road, Alaska
Highway, 1941.

Inspector checks weld in Canol pipeline,
Mackenzie Mountains, 1944.
(Public Archives of Canada)



Engineering and Construction

Transportation and Construction in the Northwest

THE EARLY YEARS

Fur-traders of the Montreal-based North West Company followed the water routes explored by the French to the western plains, then extended them north to Lake Athabasca, where they built Fort Chipewyan in 1788. A year later, Alexander Mackenzie set out across Great Slave Lake and down the long northern river that now bears his name. It proved to extend just over a thousand miles through rich new fur territory, and soon the North West Company had established trading posts along its banks at Trout River in 1796, and at sites near the present settlements of Fort Simpson, Fort Norman and Fort Good Hope in the following decade.

In the last century, the traders travelled by York boat from Methy Portage to the 16-mile stretch of rapids on Slave River above present-day Fort Smith, around which they had to portage. (This river route was shortened by the extension of rail from Edmonton to Waterways early in this century, and York boats were replaced by steamboats.) They then continued down the Slave River to Fort Resolution, across Great Slave Lake to the head of the Mackenzie, and down the Mackenzie as far as the Delta. Today, the Mackenzie River is still the principal means of transporting supplies to settlements along the Mackenzie Valley and in the Western Arctic. And it is this fleet of tugs and barges on the Mackenzie River that will have to be expanded to carry the equipment, material and supplies for the proposed pipeline.

In 1888, a Select Committee of the Senate was appointed "to inquire into the resources

of the Great Mackenzie Basin and the country eastward to Hudson's Bay," but Northern Canada first came to international notice in the late 1890s, when gold was discovered in the Yukon Territory. An estimated 100,000 men and women sought the gold fields, and almost overnight Dawson City became the largest city in Canada west of Winnipeg, with a population of over 30,000.

The city was built on difficult permafrost soils. Most of its early foundations were simple mud sills of local timbers laid in gravel or sand and levelled with the same material. Wood was the primary building material for the banks, post office, hotels and dance halls and the many homes that were built. The city acquired such urban services as running water, electric lighting and telephones. On the gold fields themselves, the Yukon Gold Company built a 70-mile ditch system to provide water for a large-scale dredging operation on the Klondike River and its tributaries. This project, which included 13 miles of 42- to 54-inch-diameter wood-stave and steel pipe, was a remarkable engineering feat on an isolated frontier.

The 1920s witnessed the development of the petroleum reserves at Norman Wells. Mackenzie himself had reported oil seepages on the river bank, but it was only in 1914 that a geologist, T.O. Bosworth, staked three claims near these seepages. Imperial Oil acquired these claims in 1919, and by 1924 six wells had been drilled, three of which were producers. A small refinery was built, but the market was so small that in the same year the wells were capped and the refinery shut down. During the development of the petroleum reserves at Norman Wells, the detrimental results of thawing perennially frozen water-bearing silts and clays soon

made themselves evident, and experimentation began with the installation of foundations on gravel pads.

In the early 1930s, after rich mineral deposits had been discovered at Yellowknife and at Port Radium on Great Bear Lake, the refinery at Norman Wells was reopened to supply gasoline and fuel oil for riverboats and mine machinery. Between 1937 and 1972, heavy fuel oil was barged from Norman Wells to the rapids on Great Bear River, transported by a 2-inch 8.5-mile pipeline around the rapids, then barged the remainder of the way to the Eldorado uranium mine on Great Bear Lake.

DEFENCE PROJECTS DURING AND AFTER THE SECOND WORLD WAR

During the Second World War the United States Army undertook two major construction projects in the Canadian North: the Northwest Staging Route and an associated highway, now called the Alaska Highway; and the Canol Project to transport men, materials, equipment and oil to defend Alaska against the Japanese.

The Alaska Highway connected Dawson Creek, B.C., to Fairbanks, Alaska, following the Northwest Staging Route airports at Fort St. John and Fort Nelson, B.C., Watson Lake and Whitehorse, Y.T., and Big Delta, Alaska. The construction began in March 1942, and it involved a force that totalled some 11,000 officers and men over the construction period. By the end of October 1942, a passable pioneer road, 1,428 miles long and 26 feet wide, linked Dawson Creek to Big Delta. Permafrost conditions were ignored during construction, which resulted in road failures and severe icings at many locations. During most of 1943, 81 contractors under the United States Public Roads Administration worked on an all-weather gravel road with a civilian