NORTHERN PIPELINE AGENCY

ANNUAL REPORT

1982-1983

Canada

Northern Pipeline Agency
Canada

Administration du pipe-line du Nord
Canada

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Acknowledgement

We wish to thank Foothills Pipe Lines (Yukon) Ltd., Calgary, Alberta, for permission to use certain of the photographs shown in this report.

Ottawa, Ontario,
December 30, 1983.

Dear Sir:

I present herewith the Annual Report of the Northern Pipeline Agency for the fiscal year ending March 31, 1983, together with the report of the Auditor General on the accounts and financial transactions of the Agency for the same period, for submission by you to Parliament as provided for under Section 13 of the *Northern Pipeline Act*.

Yours sincerely,

Mitchell Sharp

Mitchell Sharp,
Commissioner,
Northern Pipeline Agency.

The Hon. H. A. (Bud) Olson, P.C., M.P.,
Minister responsible for the
Northern Pipeline Agency,
The Senate,
Ottawa, Ontario.

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Overview

The dominant feature of the 1982-83 fiscal year covered by this report was the dark shadow cast over the entire Alaska Highway Gas Pipeline Project by the sharp deterioration in economic, financial and energy market conditions experienced both throughout North America and much of the rest of the world.

The Eastern Leg of the project went into operation as scheduled on September 1, 1982, for the initial purpose of transporting surplus Canadian gas to midwestern U.S. markets. This followed the start-up of flows through the Western Leg to California in October, 1981, and essentially marked the completion of the first stage of the system in Canada and the United States.

Although the volume of gas moving through this southern segment of the project was in keeping with contract provisions during the balance of 1982, by early 1983 U.S. shippers began reducing significantly the volume of gas from Canada. This cut-back by the U.S. shippers followed a sharp decline in demand for gas from their own customers as a result of a combination of factors—severe economic recession, conservation, an unusually mild winter, and growing competition from other energy sources that emerged because of a substantial increase in U.S. gas prices at a time when costs of alternatives such as electricity and residual oil were stable or declining.

Early in the fiscal year, plans for proceeding with second-stage construction of the remaining northern segments in Alaska and Canada also suffered a serious set-back (as indicated in the last Annual Report). As a result of the approval by Congress in late 1981 of the package of amendments to the U.S. pipeline legislation proposed by the Reagan Administration, the Alaskan pipeline sponsors and gas owners earlier were optimistic that the way was clear for the second stage of the project to move ahead expeditiously. At a procedural conference before the Federal Energy Regulatory Commission (FERC) in Washington on March 16, 1982, they had confidently outlined a timetable that aimed for completion of the entire system by late 1987. Following a meeting of the gas owners and the Alaskan and Canadian pipeline sponsors in Salt Lake City only six weeks later, however, it was announced that the scheduled date for bringing the second stage into operation had been put back to 1989 because of the adverse impact of the economic slow-down, depressed crude oil prices and financial market uncertainties.

As a result of the completion of first-stage construction and the further two-year delay in the scheduled completion date for the remainder of the system, both the U.S. and Canadian sponsors began to undertake substantial cut-backs in personnel employed on staff or retained on contract. Similar reductions were also initiated by the two regulatory bodies primarily responsible for overseeing planning and construction of the project—the Northern Pipeline Agency in Canada and the Office of the Federal Inspector in the United States—because of the consequent decline in their own level of activities. (In the final section of this report, headed Taking Stock, the Hon. Mitchell Sharp, Commissioner of the Northern Pipeline Agency, provides a brief review of the principal developments involving the Agency over the course of its first five years of operation.)

During the fiscal year, the sponsoring companies and regulatory agencies in both countries continued to be involved with the completion of construction, clean-up and revegetation required on the Eastern Leg. Sponsors in the two countries also continued to carry forward some planning activities involving second-stage construction of the northern segments of the project. In addition, the Alaskan pipeline sponsors and producers focussed considerable attention on the development of a viable financial plan for funding the remainder of the system and for resolving potential problems of marketing Prudhoe Bay gas during the early years in competition with other energy sources.

Major U.S. Developments

As already indicated, the U.S. portion of the Eastern Leg, which extends for 1 324 km (823 mi.) from a border point near Monchy, Saskatchewan, and Port of Morgan, Montana, to Ventura, Iowa, was begun in the spring of 1981 and completed in time to allow the commencement of the flow of Canadian gas by September 1, 1982. A ceremony was held by the U.S. sponsor, the Northern Border Pipeline Co. in Bismarck, North Dakota, on October 4, 1982, to mark the completion of the undertaking, which is the largest single pipeline project ever carried out in the United States. At present, the system has a capacity to carry a maximum daily gas volume of 27.6 $\times$ $10^9 m^3$ (975 million cubic feet). Among those attending the ceremony were Vice-President George Bush, then Energy Secretary James Edwards, and the Hon. Mitchell Sharp, Commissioner of Canada's Northern Pipeline Agency.

The move toward completion of the Eastern Leg during the early months of the new fiscal year was overshadowed to a considerable extent by the earlier announcement on April 30, 1982, by the Alaskan sponsors of the further set-back in plans for proceeding with construction of the northern segments of the project. The statement issued by the participants to explain their decision noted that "financial planning must necessarily take into account changing circumstances which are beyond the control of the project, such as the current short-term excess world energy supply, depressed crude oil prices, lower levels of economic activity in the U.S. and abroad, and uncertainties in financial markets".

Early in July of 1982, it was indicated that the three major owners of gas at Prudhoe Bay—Exxon, Sohio and Arco—had been accorded an enhanced position in the management of the Alaskan segment of the project in line with the enabling amendment to the governing U.S. legislation enacted by Congress late the previous year. Sidney J. Reso, Senior Vice-President of Exxon, was elected to the post of Vice-Chairman of the Design and Engineering Board of the Alaska Natural Gas Transportation System—an organization originally established in June, 1980, to provide for initial producer participation in the planning of the project. At the same time, the producers also became more extensively involved in the development of a financial plan through the appointment of Claude C. Goldsmith, Senior Vice-President and Chief Financial Officer of Arco, as Co-Chairman of the Financial Advisory Committee established under the Design and Engineering Board. The other Co-Chairman appointed was Larry Robertson, a Houston financial consultant who represented the pipeline sponsors of the system, a consortium that had been reduced from 10 to 9 pipeline companies with the withdrawal in May, 1982, of American Natural Resources.

Throughout the balance of the fiscal year, the participants in the Alaskan segment of the project continued to carry out extensive studies of financing and marketing issues that remained to be resolved. Some initial consideration was given also to means by which the initially high costs of transporting Alaskan gas to markets in the lower 48 states could be levelled out so as to make it more competitive with other alternative energy sources.

A number of technical issues associated with the Alaskan segment of the system continued to be examined. Testing and research programs related to the problem of frost-heave of pipe carrying chilled gas through areas of discontinuous permafrost, for example, were maintained. A new study was also launched into the feasibility of adopting a process for conditioning the gas at Prudhoe Bay that appeared capable of being put in place with a significantly shorter lead time and built and operated at significantly lower cost than the system originally proposed.

Following the announcement at the end of April, 1982, regarding the set-back in the scheduled completion date for the entire system to 1989, both the Alaskan pipeline sponsor and the Office of the Federal Inspector (OFI), the counterpart to Canada's Northern Pipeline Agency, quickly initiated plans for substantial cut-backs in personnel. Between the end of April, 1982, and March, 1983, staff and contract personnel engaged by Northwest Alaskan were reduced from just over 800 to approximately 85. During the same period, the staff of the OFI was cut from 135 to around 45.

Following the commencement of operations of the Eastern Leg in September, 1982, the volumes of gas flowing through the system built up steadily over the

remainder of the calendar year and during the first two months of 1983. By late February, however, the developing pressures being experienced in U.S. markets as a result of sharply declining demand and a growing domestic gas surplus began to have a sharp impact on the throughput of supplies via the pre-built sections of the Alaska Highway Pipeline. On February 25, 1983, United Gas Pipelines Ltd., one of three U.S. shippers that had contracted with Northwest Alaskan Pipeline Co. for gas from Pan-Alberta for delivery through the Eastern Leg, invoked *force majeure.* In effect, the company declared it could no longer accept and pay for even minimum contracted volumes because of circumstances beyond its control. Only a few days later, Northwest Alaskan also resorted to a declaration of *force majeure* to justify non-compliance with the terms of its contract with Pan-Alberta, which the Calgary company refused to accept as valid.

Although the move to bring about a modification of contractual commitments was first initiated by United Gas, it reflected the difficulties being experienced in greater or lesser degree not only by the two other U.S. shippers on the Eastern Leg and the single U.S. shipper through the Western Leg, but by virtually all U.S. gas transmission companies. As a result of a sharp decline in the demand for gas, most pipeline companies found themselves under contract to take or pay for substantially more supplies than they could sell. In March, 1983, Pan-Alberta launched into an intensive round of negotiations with Northwest Alaskan and the U.S. shippers through the Eastern and Western Legs of the Alaska Highway Pipeline in an effort to seek a compromise solution that would be acceptable to all concerned, including the Canadian producers of the gas acquired by Pan-Alberta and the regulatory authorities in both countries. Several other Canadian exporters of gas to the United States also found themselves under the same intense pressure to agree to a substantial modification of the take or pay terms entered into by U.S. shippers. By the same token, the Canadian government was also being increasingly pressed by U.S. interests to reduce the price of gas exported south of the border from the level that had prevailed since April, 1981, of $4.90 (U.S.) per 1,000 cubic feet. Notwithstanding the substantial increase that had taken place in average U.S. domestic gas prices since the Canadian price was set at that level,

An orifice plate is lowered into the yard piping system to measure gas volumes and pressures at the compressor station under construction at Piapot, Saskatchewan.

American shippers, among others, argued that gas imports from Canada had become increasingly uncompetitive in a number of U.S. markets.

Major Canadian Developments

The Eastern Leg of the Alaska Highway Gas Pipeline in Canada, which involved construction of a system extending for 636 km (395 mi.) through Alberta and Saskatchewan at a cost of some $730 million, went into operation, as indicated previously, by the beginning of September, 1982. Because of a strike by workers belonging to the building trade unions in Saskatchewan, however, three compressor stations and a meter station in the province still remained to be completed by the time that gas began flowing through the pipeline to the United States. The sponsor of the Canadian section, Foothills Pipe Lines (Yukon) Ltd., succeeded in overcoming these difficulties through the implementation of a series of temporary alternative arrangements employing the compression and metering facilities of Nova, An Alberta Corporation. Nova, one of Foothills' parent companies, operates parallel facilities throughout most of the length of the Eastern Leg in Alberta. (All of the Foothills' facilities had been completed and granted leave-to-open by the National Energy Board as of May, 1983.)

In a report issued in January, 1983, on the outcome of extensive hearings held the previous year with respect to a number of applications for the export of additional Canadian gas, the National Energy Board granted authorizations that would permit a further 362 billion cubic feet of gas to be delivered to the United States through the Western Leg over the period from 1988 to 1992 and 1.54 trillion cubic feet through the Eastern Leg during the same period.

For Canadian producers, the extension of the period authorized by the National Energy Board for the further export of gas through the Eastern and Western Legs was potentially of considerable importance from a revenue point of view. As a condition of providing debt financing for construction of the two Legs in Alberta and British Columbia, the lending banks required that this debt be completely repaid within the eight-year period of gas flows through the system initially approved by regulatory authorities in both countries. Meeting this stipulation would require that the pipeline be depreciated at an exceptionally rapid rate, which in turn would substantially reduce the netbacks that would be received by Alberta producers on gas sales to the United States through the system.

Subsequently it was agreed to forestall temporarily imposition of this burden on producers by maintaining depreciation of the pipeline at the more normal rate of four per cent in the hope that the subsequent arrival of Alaskan gas or the approval of further Canadian gas exports through the system for an extended period would make it possible to circumvent or minimize the problem. In the event that neither of these developments occurred, it was understood that it would be necessary to impose an exceptionally high level of depreciation in the last four years of the approved gas export contracts to make possible complete amortization of the bank loans. While the approval by the NEB of the extension of gas flows through the pre-built sections offered some promise that this outcome could be avoided, by the end of the fiscal year the necessary application for approval of further imports had yet to be submitted to U.S. regulatory authorities.

Sen. H.A. (Bud) Olson, Minister responsible for the Agency (left), meets with members of the Northern British Columbia Advisory Council in Calgary in July 1982.

As more fully explained in the following section on Agency activities, certain questions concerning the routing of the pipeline in Yukon were raised by the Environmental Assessment and Review Panel in its interim 1979 report with respect to environmental issues in the territory. In its final report of September, 1982, the Panel endorsed the routing proposed by the sponsor company in three areas. In a previous report issued in July, 1981, the Panel expressed concern that routing of the pipeline through the Ibex Pass west and south of Whitehorse, as proposed by Foothills, could have an adverse effect because of the increased access that might be provided to the area following construction. Subsequently the Yukon Territorial Government announced its intention of designating the Ibex Pass as a Special Management Area in order to deal with the problems identified by EARP.

On March 1, 1983, the Hon. H. A. (Bud) Olson, Minister responsible for the Northern Pipeline Agency,

announced that he had approved the final routing of the 830-kilometre section of the pipeline through Yukon. This final routing included the line through the Ibex, which was endorsed both by the Yukon Territorial Government and Yukon Advisory Council. The announcement paved the way for the eventual lifting of the development freeze imposed since 1977 on an eight-kilometre corridor straddling the route originally proposed by Foothills.

A suit launched in September, 1980, against the Governor in Council by Ian Waddell, New Democratic Member of Parliament for Vancouver-Kingsway, alleging that all Orders in Council previously approved that cleared the way for a start on pre-building the southern segment of the project were *ultra vires*, continued to work its way through the judicial process. In July, 1981, a B.C. Supreme Court Justice rejected the contention of the federal government and Foothills that the provincial Supreme Court lacked jurisdiction to consider the issue and that, in any case, Mr. Waddell lacked the necessary standing to press the action before any court of law. Applications for leave-to-appeal against both of these rulings initially were filed in the B.C. Court of Appeal by both the federal government and Foothills. The government, however, subsequently abandoned its application, which was consequently dismissed. While the company continued to press its own application, the Court in a ruling in October, 1982, declined to grant leave-to-appeal on the grounds that the matter had become academic since the action would proceed against the Governor in Council. Subsequently, Foothills, acting alone, sought to carry the case to the Supreme Court of Canada. In December, 1982, however, the Court ruled against a hearing of the appeal. The hearing on the substantive issue raised by Mr. Waddell was due to be heard by a judge of the B.C. Supreme Court in May, 1983. (In a judgment handed down in November, 1983, Mr. Justice Kenneth Lysyk dismissed the suit lauched by Mr. Waddell on the grounds that the Governor in Council had not been shown to have exceeded the authority granted under the *Northern Pipeline Act* in authorizing prebuilding of the southern segments of the system.)

Over the course of the fiscal year, the Committee of the House of Commons on Northern Pipelines, which was established in 1978 to provide continuing parliamentary surveillance with respect to the Alaska Highway Gas Pipeline Project, met three times to receive the testimony of the Minister and senior officials of the Northern Pipeline Agency. The Minister appeared before the Special Committee of the Senate on the Northern Pipeline in May, 1982, and a sub-committee of the Senate body met informally in Calgary with senior Agency officials based there with respect to the Committee's study of matters involving offshore transportation of oil and gas in the Canadian Arctic.

As outlined more fully in the following section, the Yukon and North B.C. Advisory Councils, which were established under the provisions of the *Northern Pipeline Act* to provide advice to the Minister responsible for the Agency, and the Federal-Provincial-Territorial Consultative Council, which was also created in keeping with the terms of the legislation, all continued to be actively engaged in carrying out their respective functions during the course of the year.

For those who may be interested, a brief outline of the role of the Northern Pipeline Agency can be found in Appendix B and a description of the Alaska Highway Gas Pipeline Project in Appendix C. A listing of the senior personnel of the Agency and the addresses and telephone numbers of Agency offices are provided in Appendix D.

Foothills inspectors check the depth of the ditch for the pipeline crossing of Serviceberry Creek along the Eastern Leg in Alberta.

Operations of the Northern Pipeline Agency

Agency Activities

Following announcement on April 30, 1982, of a further two-year delay, to 1989, in the scheduled completion date of the Alaska Highway Gas Pipeline, the Northern Pipeline Agency began to phase down its operations to conform with the declining pace of activities of Foothills Pipe Lines (Yukon) Ltd.

On July 30, the Hon. Mitchell Sharp, Commissioner of the Agency, announced that Agency staff would be cut back by 20 per cent as of the end of September and further reduced substantially over the next 12 months. The decision followed a similar move in May by Foothills (Yukon) to decrease immediately its own staff of 650 by 20 per cent and to undertake significant cut-backs over the next several months. By the end of the fiscal year in March, 1983, Foothills staff had been reduced to approximately 210, 110 assigned to tasks associated with the Eastern and Western Legs and the balance to planning for Stage Two Construction of the pipeline. The initial 20 per cent reduction in Agency staff, from a peak strength of 104, began in May and continued through to September, when the Eastern Leg of the pipeline went into operation. For those staff members within the Agency whose services were not required in the immediate future, Agency officials made arrangements for temporary secondment through the Public Service Executive Interchange Program and other means to offices of other federal Government departments and agencies across Canada.

By March 31, 1983, the Agency had cut back staff employed on its behalf on a full-time basis by 55 per cent through attrition, lay-offs and secondments affecting all of the Agency's offices, leaving the equivalent of full-time employees on staff at 48 persons. Twenty-three people were seconded full time to other federal departments and agencies. Fifteen employees were on partial secondment, with more than 10 per cent of their time spent on Agency affairs. By the end of the fiscal year, a total of 26 people had permanently left the Agency since the previous May.

The remaining core group continued with ongoing work related to the pipeline project. Arrangements for the easement of Crown land for the pipeline right-of-way in Yukon were largely completed in preparation for their approval by the Governor in Council. In addition, administrative arrangements were also made to reserve Crown land in Yukon that will be required off the right-of-way for such purposes as compressor stations. The Agency's environmental group concentrated on monitoring the results of the reclamation and revegetation work carried out along the constructed sections of the Western and Eastern Legs. Work continued in the review of environmental and geotechnical matters associated with construction of the pipeline in Yukon and discussions continued among the Agency, Foothills and various provincial and territorial government officials with respect to the issue of compensation for loss of livelihood.

During the year, the Agency dealt with more than 200 individual submissions by the Foothills Group of Companies related to both first- and second-stage construction. Thirteen submissions related to the socio-economic and environmental terms and conditions and 12 were in connection with pipeline crossings of highways, utilities, navigable waters and railways. About 70 submissions related to design and engineering, and construction scheduling matters.

The National Energy Board issued a total of 18 leave-to-open orders during the year, all involving completed sections of the pipeline or other facilities which form part of the Eastern Leg.

The final tie-in weld, completed on August 17, 1982, south of Beiseker, Alberta, wraps up construction of the Eastern Leg of the pipeline in Canada.

Socio-Economic and Environmental Plan Review

Following last year's approval of schedules for the submission and review of socio-economic and environmental protection plans for construction of the pipeline in northeastern British Columbia and southern Yukon, Agency staff reviewed about 15 draft and final plans. In addition, the Agency also considered revisions to previously approved plans submitted by Foothills. The plans outline how each of the segment companies intends to fulfil the terms and conditions established by the Agency for each construction section.

The information, consultation and liaison plan of Foothills (North B.C.) was found to be generally acceptable by the Agency in April, 1982. The plan outlines how the company will provide information on the pipeline and maintain consultation and liaison with respect to government agencies, communities, and native and other special interest groups affected by the project. Other draft plans received from the company involved housing, opportunity measures for employment of native people and women generally, and measures for protection of recreational areas and traditional resources. Consideration of these plans by the Agency and others has been deferred until the start of second-stage construction is confirmed.

The final version of the information, consultation and liaison plan prepared by Foothills (South Yukon) was also received by the Agency during the fiscal year, as were plans on housing and traditional resource protection. The company's work-camp plan received qualified acceptance from the Agency in August, 1982.

Native Relations

The Treaty 8 Tribal Association in April, 1982, entered into a contract with the Agency to seek the views of northeastern British Columbia's native people on a variety of issues, including the proposed route of the pipeline through the region and the location of facility sites such as compressor stations and construction camps. A further issue addressed by these community consultations was compensation for loss of livelihood resulting from disruption to trapping, hunting or fishing that might be caused by the pipeline project.

Several meetings were held during the year among members of the Treaty 8 Tribal Association, Foothills representatives and Agency staff. The Association filed a draft report of its work with the Agency in February, 1983.

Up until the time of the announced project delay in April, 1982, the Agency sought proposals for similar work from the Kaska Dena Council, also of northeastern B.C.

The project delay also ended negotiations with the Indian Association of Alberta on a proposal to conduct a traditional resource use inventory in the region to be crossed by the pipeline in northern Alberta.

The Agency's Vancouver office staff held several meetings during the year with the executive directors of the Friendship Centres in Fort Nelson and Fort St. John.

The Yukon office remained in consultation with the Office of Native Claims (ONC) and the Yukon Government's land claims negotiators in order to devise a formula for the granting of an easement for the pipeline right-of-way extending through Indian lands following settlement of land claims in the territory. Good working relations were maintained with the ONC, the Council for Yukon Indians, and Yukon Government negotiators on easement matters respecting land claims all of which were resolved.

The process established last year by Foothills and the Agency to reserve Yukon land under federal control by notation was used as a means to resolve potential conflicts between land requirements for pipeline construction and traditional land-use by Yukon Indians.

Federal-Provincial-Territorial Co-ordination

Throughout the year, the Agency continued to co-ordinate consultations with various federal, provincial

and territorial government bodies with respect to the review of socio-economic and environmental plans. For the third consecutive construction season, Alberta government personnel worked with the Agency field surveillance teams on a part-time basis.

Quarterly meetings, usually by conference call during this fiscal year, continued among members of the Federal-Provincial-Territorial Consultative Council (FPTCC), which was established under the terms of the *Northern Pipeline Act*. At the Council's last meeting for 1982, held on December 17 at the Agency's operational headquarters in Calgary, Agency officials briefed members on the status of the project, including the sponsors' plans and projected budgets for the new year.

Chaired by the Commissioner of the NPA, the FPTCC consists of senior representatives from the Agency and the Governments of Yukon, British Columbia, Alberta and Saskatchewan. The purpose of the Council is to maintain continuing consultation on intergovernmental matters related to the Alaska Highway Gas Pipeline in Canada. Bilateral consultations between officials of the Agency and the various provincial and territorial bodies involved in the project were, of course, undertaken on an ongoing basis as required.

Regional Advisory Councils

Both the Yukon and Northern British Columbia Advisory Councils continued to function during the fiscal year. Because of the project delay, however, both Councils decided in late 1982 that for the immediate future they would meet only quarterly rather than continuing to meet on a monthly basis.

The Northern B.C. Council in August closed its office in Fort Nelson, retaining a part-time staff member. Among the highlights of the year was a meeting held in Calgary in July, 1982, between the members of the Council and Sen. H. A. (Bud) Olson, Minister responsible for the Northern Pipeline Agency, to discuss labour relations, business opportunities and transportation issues.

In November, the Governor in Council, effective September 27, 1982, appointed three new members and reappointed seven original members to the Northern B.C. Council for two-year terms. By the close of the fiscal year, the Northern B.C. Council was developing a proposal for local manpower training in pipeline construction-related skills.

The Hon. Mitchell Sharp, Commissioner of the Agency, addresses guests at the dedication ceremony given by Northern Border Pipeline Co. of Bismarck, North Dakota on October 5, 1982, to mark completion of the Eastern Leg of the pipeline and the first flow of gas through the facilities.

Other Consultations

The Agency followed project developments in the United States and maintained close liaison with its American counterpart, the Office of the Federal Inspector. Formal meetings between the two regulatory bodies were held in May in Washington, D.C., and in October in Bismarck, N.D. The Agency's Yukon office also kept in contact throughout the year with representatives of the State of Alaska.

In September, senior officers of the Agency hosted a meeting in Calgary with representatives of Stat Oil, a Norwegian Crown corporation. The potential problems of construction of high-pressure pipelines in deep water and on land, as well as the additional difficulties encountered when constructing large facilities in the North, were discussed.

Senior Agency officials also met in Calgary in September with representatives of the Swedish National Inspectorate of Explosives and Flammables to discuss the impact of high-pressure natural gas transmission lines. This delegation also met with representatives of the Foothills Group of Companies and Nova, An Alberta Corporation, in Calgary, and TransCanada PipeLines Ltd. in Toronto.

The Agency also arranged for senior officers of the Concrete and Silicate Laboratory of the Technical Research Centre of Finland to meet with representatives of the Northern Canada Power Commission both to discuss and observe winter construction in the Canadian Arctic.

In February, 1983, Agency staff met with the Horte Task Force on Pipeline Construction Costs to review issues associated with regulatory control and the costs of regulation with respect to major pipeline projects. The Task Force also met with other regulatory agencies and pipeline construction and operating companies.

Senior Agency officials attended a ceremony held by the Northern Border Pipeline Co. in Bismarck, N.D., in October, 1982, to mark the completion of construction of the Eastern Leg of the Alaska Highway Gas Pipeline and the first flow of gas through the facilities. The Commissioner of the NPA was among the speakers.

Staff from the Vancouver and Whitehorse offices continued to meet with groups and individuals in the vicinity of the proposed pipeline route in northeastern British Columbia and Yukon and to provide updates on the Alaska Highway Gas Pipeline Project to the regional advisory councils.

During the year, Agency officials participated in a number of speaking engagements, which included presentations to various Chambers of Commerce, conference addresses and talks to student groups. In its Annual Western Business Outlook Conference held in early June in Calgary, the Conference Board of Canada devoted a session to the Alaska Highway Gas Pipeline Project. A. Barry Yates, the Agency's Deputy Administrator, Policy and Programs, spoke to the conference on the industrial benefits to Canada of the pipeline project.

Manpower Planning and Labour Affairs

The March, 1982, draft of Section II of the Manpower Plan dealing with construction of the Yukon segment of the pipeline and with the operations phase of the entire line was reviewed during this fiscal year by representatives of the Yukon Territorial Government, the Canada Employment and Immigration Commission, and Agency staff. The results of this review were subsequently conveyed to Foothills.

The draft includes the Opportunity Measures Plan, which outlines the steps the company will take to provide for the training and employment of native people and women. The company's previously approved Opportunity Measures Plans were successfully implemented during construction in 1982 on the Eastern Leg, with employment of native people averaging about 6.5 per cent of total workdays on the pipeline itself and approximately 5.5 per cent on the related facilities. The participation of native people in the work-force was consistent with their proportionate representation in the two provinces. Employment of women on the project during 1982 was 4.4 per cent on the pipeline and 3.3 per cent on its related facilities.

A building trades strike in Saskatchewan, which lasted from early May to late August, 1982, delayed completion of the compressor stations at Piapot and Richmound and both the compressor and meter stations at Monchy. This work stoppage did not affect the opening date of September 1, 1982, of the Eastern Leg as approvals were granted to bypass the Monchy station with a short section of line and to meter the gas at McNeil, Alberta, on a temporary basis by employing facilities on the adjacent Nova pipeline.

Transportation and Logistics

In October, 1982, the Agency informed Foothills that the company's transportation and logistics plan was acceptable. Because of the set-back in the construction schedule, however, the Agency deferred public review of this plan. Following such a review and any revisions that might result, the company's document would be considered for formal approval by the Agency.

Submitted by Foothills in May, the transportation and logistics plan identifies the routes and types of facilities the company plans to use for the safe and efficient transportation of pipe, materials, equipment, fuel and personnel. The plan also summarizes the measures each of the Foothills' segment companies will follow to ensure minimal disruption of regional transportation services.

With the co-operation of the Yukon Government and Public Works Canada, the Agency sponsored a four-month traffic study along the Alaska Highway during the summer of 1982. Local high school students were hired to obtain information on the numbers, types and directions of vehicles travelling along the Alaska Highway between the Yukon-British Columbia border and the Yukon-Alaska border. Since the highway will be one of the main routes used for the supply of pipe and materials for the Alaska Highway Gas Pipeline in Yukon, the study provided a data base against which the increase in traffic and large-sized vehicles related to the project can be measured.

Exercise of Delegated Federal Regulatory Powers

The Agency issued a number of permits and authorizations during the year under the authority of the *Northern Inland Waters Act* and the *Territorial Lands Act*, which for the purposes of the pipeline was transferred to the Minister responsible for the Northern Pipeline Agency.

In Yukon, one land-use permit was issued to Foothills in respect of geotechnical investigations. Several land-use permits were amended or extended to allow Foothills to complete weather monitoring observations, ground-water studies, and to continue operation of the Quill Creek Test Site.

An Agency official based in Whitehorse administered the permits and carried out field inspections to ensure compliance with the provisions governing these activities.

Discussions continued with the Yukon Territorial Government and the Department of Indian and Northern Affairs (DINA) to establish the terms for a grant of easement to Foothills (South Yukon) for a right-of-way across Crown land for pipeline purposes. By year's end, a final draft of the agreement relating to the grant had been prepared and agreed to by all concerned parties.

Also during the latter part of the year, the Agency submitted to DINA a number of applications for temporary reservations of Crown land in Yukon, these being lands required for work-camps, storage disposal sites, and other purposes during construction of the pipeline.

Field Surveillance

A four-man team of surveillance officers representing the Northern Pipeline Agency was established at a field office in Beiseker, Alberta, 58.5 km (35 mi.) northeast of Calgary, to oversee Eastern Leg construction activities when they resumed in the province in March, 1982. By early April, these activities were in full swing with the commencement of welding, coating and wrapping, and lowering-in of pipe in four sections extending over a total distance of 207 km (128.5 mi.). Installation was also begun of a second, electrically driven compressor unit at Jenner. In addition, work was resumed from the previous year on the assembly of mainline valves and the installation of cross-over installations linking the Eastern Leg in Alberta with a parallel section of pipeline owned by Nova.

Test run near Standard, Alberta, of a prototype coat and wrap machine which uses state of the art technology for hydraulic operation and electronic controls.

The Foothills' contractor in Alberta, Marine Pipeline Construction of Canada Ltd., began construction on a 62-km (39-mi.) section extending eastward from a point near Rosebud to Gem. Marine began in June to move westward from the Rosebud area to Hicklon Lake. This sequence of work was the result of spring thaw conditions and government-imposed road bans that would otherwise hamper construction activity.

These mainline activities concluded on August 23 and the field surveillance office at Beiseker was closed a few days later.

As noted previously, resumption of construction in 1982 of three compressor stations and a meter station in Saskatchewan was delayed by a building trades strike for several months, but got under way again in September. A surveillance office located in Medicine Hat was closed in late October, but two surveillance officers remained in the vicinity to oversee compressor station construction.

By March 31, compressor station construction was virtually complete and the remaining two surveillance officers were released.

During the 1982 construction season, as in previous years, the field surveillance offices provided daily reports by facsimile transmission machines to the Agency's main operational office in Calgary, which in turn fed the information into a computer data bank. The nature of the daily report was further refined during the course of construction activity to provide an ongoing record of the progress being made for the use of the NPA, the National Energy Board, and the Government of Alberta.

The Agency's Senior Surveillance Officer arrives on site to investigate progress of Eastern Leg construction in 1982.

Environmental Surveillance and Monitoring

As a means of bolstering its ability to identify and conduct surveillance on archaeological sites, the Agency engaged the services of a staff archaeologist in early 1982. Liaison with Alberta Culture and the Province of Saskatchewan's Heritage Management Division resulted in successful protection of archaeological sites along the Eastern Leg during the 1982 construction season. This officer's specialization in the assessment of resource development impact on traditional life-styles and land-use practices was also utilized in the review of socio-economic plans and reports submitted by Foothills on archaeological and cultural matters.

In the spring of 1982, the Agency's environmental group began field trips as part of a program developed earlier in the year to monitor completed portions of the pipeline right-of-way in Alberta, Saskatchewan and southeastern British Columbia to ensure continued compliance with the environmental terms and conditions. The group monitored the success of revegetation and erosion control methods, fisheries and wildlife protection, slope stability and water quality.

Agency environmental staff also undertook the analysis and interpretation of wildlife observation data collected by surveillance officers during 1981 and 1982 construction.

Engineering Activities

By the beginning of the fiscal year, the Designated Officer had granted all of the engineering approvals required by Foothills to begin construction of the final 207 km (129 mi.) of the mainline of the Eastern Leg in Alberta. Marine Pipeline Construction of Canada Ltd., Foothills' contractor, had begun construction in late March on a 62-km (39-mi.) section running east from Jenner to the South Saskatchewan River. Marine was also under contract to fabricate and install valve assemblies at 32-km (20-mi.) intervals along the Eastern Leg, including the portions built in 1981 in Saskatchewan and Alberta.

In addition, the Foothills' program in Alberta included the installation of a second, electrically driven compressor unit at Jenner. (The first compressor unit, a gas-powered turbine, was installed at Jenner in 1981.)

During the year, Foothills put forward for the Agency's consideration a number of new technical submissions and revisions to previously submitted or approved documents and drawings. A total of 25 submissions related to detailed design drawings, 7 related to welding procedures, 17 concerned the hydrostatic testing of the pipeline, compressor and meter stations, and 13 were associated with construction inspection procedures and scheduling. All of these additional submissions were subsequently approved by the Designated Officer. All hydrostatic testing of the pipeline was also monitored by Agency staff to ensure compliance with National Energy Board and NPA requirements, accepted practice and approved procedures.

Marine Pipeline completed the valve assembly installations within the same time frame as mainline construction in Alberta. On August 25, the NEB granted leave-to-open the last section of the Eastern Leg and the first compressor unit at Jenner.

The 1982 Eastern Leg construction program in Saskatchewan consisted of valve assembly installations, completion of the compressor stations at Piapot and Monchy, a meter station at Monchy, and the start of construction of an additional compressor station at Richmound.

As noted previously, an extended building trades strike in Saskatchewan in early May halted work on all compressor and meter stations within the province. As a result, it became impossible for these facilities to be completed by September 1, the date the Eastern Leg was scheduled to become fully operational. The strike compelled Foothills to install a temporary bypass around the Monchy compressor and meter stations to accommodate the scheduled gas flows to the United States. In addition, Foothills installed further cross-over connections with the parallel Nova pipeline to make use of its compression capacity and to utilize its metering station at McNeil near the Alberta/Saskatchewan border to measure the export gas flows along the Eastern Leg. The Agency's engineering staff reviewed the criteria and detailed designs for these project revisions and the Designated Officer issued the necessary approvals for the work to proceed on schedule. Construction of the compressor and meter facilities resumed following settlement of the building trades dispute in late August, 1982.

Construction in Saskatchewan proceeded smoothly during the remainder of the fiscal year, although it was necessary to revise schedules to reflect the effect of the Saskatchewan strike and the advent of harsher than usual winter conditions. Agency staff witnessed all hydrostatic testing at the remaining stations as construction progressed. The Monchy meter station was granted leave-to-open on November 24, allowing for the isolation and disconnection of the temporary bypass. (This pipe was removed and reclaimed during the summer of 1983.) Leave-to-open was granted for the Piapot station on January 26, 1983, and for the Monchy compressor station on February 16. (Work on the Richmound station was completed and leave-to-open granted on May 9, 1983.)

During the year, the engineering staff of the Agency also completed its review of the detailed design criteria formulated by Foothills for overcoming the potential problem of scouring as it involves pipeline crossings of rivers and streams in southern Yukon. The staff also kept abreast of the activities of the Cold Regions Engineering Technical Committee, which was established by the Office of the Federal Inspector in the United States to advise the Federal Inspector on frost-heave and other cold region matters.

Quill Creek Test Facility

Foothills Pipe Lines (Yukon) Ltd. maintained monitoring all test installations at the Quill Creek Test Facility. The number of Foothills' staff working on the site was reduced when the nearby camp facilities were closed and moved out but data from the test installations continued to be gathered by automatic, remote electronic read-outs and by periodic manual surveys by Foothills' staff from Whitehorse and Calgary. Minor gaps in the data collections have occurred due to lightning-induced and other temporary technical failures.

Maximizing of Pipe Stability in Problem Areas

The staff of the Agency continued its review of concepts and criteria developed by Foothills and its consultants as a means of maximizing the stability of the pipeline in areas in South Yukon that posed potential problems. These included problems of frost heave and thaw settlement in areas of discontinuous permafrost, problems of shifting soil structures and of the liquefaction of the soil that can be caused by earthquakes in the several seismically active areas through which the pipeline is to be routed, and problems of achieving stability of the pipe along various types of ground slopes.

From the beginning, it was anticipated that the gas from Prudhoe Bay would be maintained below the freezing point as it moved through the pipeline in Alaska. Originally, Foothills proposed that the gas be maintained in a chilled state until it reached the first compressor in Yukon, which is to be situated at a point about 65 km (39 mi.) from the Alaskan border. In late 1981, however, Foothills decided that it would be preferable to maintain the gas in chilled condition until it reached the second compressor station in the Territory, which is proposed to be located approximately 214 km (133 mi.) from the Alaskan border. As of the end of the year, however, the company had not submitted reports to the Agency indicating the implications of this change in design with respect to pipeline stability, particularly as it relates to problems of frost heave and thaw settlement.

The additional site specific investigations needed to complete the analysis have also not been submitted to the Agency. With the announced delay in project completion in April, 1982, Foothills significantly reduced its field drilling and testing programs.

The geotechnical program subsequently was restricted to portions of the route where minor relocations were being considered for improved road and river-crossing sites. During the fall, Foothills also located and instrumented a new test area called the Marsh Lake Active Layer Heave Site. The objectives of this investigation are to measure the amount of frost heave occurring in the active layer of earth during and after "freeze-back" of the soil, and to evaluate various methods for measuring ground heave.

Construction crews wrap the pipe in wire mesh prior to its encasement in concrete.

Environmental Assessment and Review Panel for Yukon

In a final report submitted to the Minister of the Environment in October, 1982, the federal Environmental Assessment Panel studying the implications of building the Alaska Highway Pipeline said it was "satisfied that Foothills has demonstrated the ability to design the project in a manner that will avoid major environmental impacts and will give protection to fishery and wildlife resource values along the pipeline route". The Panel further stated that the company and regulatory authorities concerned, primarily the Northern Pipeline Agency, "have a good grasp of the physical and biological problems and the options for solutions to these problems". The report is based on hearings held in June, 1982, in Whitehorse, Yukon—the third set of hearings held since 1979 on Foothills' environmental planning for the pipeline project.

The Panel noted certain areas where further research and development were needed, especially with respect to geotechnical matters. It recommended studies continue on frost heave and thaw settlement in areas of discontinuous permafrost to ensure the pipe will remain stable and operate safely.

An electrically driven compressor, the second unit for the Jenner, Alberta, compressor station, is moved into place.

The technical feasibility of the Kluane Lake crossing also required ongoing review, the Panel concluded, as did river-crossing designs and revegetation and erosion-control procedures. In addition, the report listed several documents Foothills should prepare, including a plan on the location, operation and restoration of granular resource sites and a report on areas where waterfowl are prone to disturbance.

The Panel agreed with the routes proposed by the company in the Marsh Lakes-Michie Squanga region southeast of Whitehorse, the Rancheria Valley area near the British Columbia border, and across Kluane Lake. As indicated earlier, and elaborated on in the following section, the Environmental Assessment Panel raised questions in a previous report regarding the routing of the pipeline through the Ibex Pass area west and south of Whitehorse which led to further consideration of this issue by both the Yukon Territorial Government and the Agency.

Establishment of the Pipeline Route Through Yukon

The major question at issue with respect to the proposed routing of the pipeline through Yukon, which was brought to the fore by the Environmental Assessment Panel in its report of July, 1981, involved the proposal by Foothills to run the line through the Ibex Pass to the west and south of Whitehorse.

While the Panel concluded that the pipeline could be installed without unduly adverse environmental impact, it expressed concern that ongoing damage to the environment might be caused by easier entry of people to the area that could be provided along the pipeline right-of-way and access roads following construction. In addition, the Panel also expressed concern that the choice of the Ibex passage would foreclose alternative locations for linking the mainline with the proposed Dempster Lateral to provide access to Canadian gas in the Mackenzie Delta.

In response to the potential environmental problems associated with increased access to the Ibex region that the Panel identified, the Yukon Territorial Government and the Northern Pipeline Agency jointly funded a study by an independent consultant on alternative means available to preserve the environmental character of the area regardless of whether or not the pipeline were extended through it.

Following consideration of the consultant's study, the Yukon Territorial Government announced in early 1983 that it intended to designate the Ibex Pass as a Special Management Area in order to protect the land and wildlife inhabiting it. The Yukon Territorial Government also endorsed the routing of the pipeline through the Pass. The Yukon Advisory Council had earlier expressed support for the Ibex route provided that special measures similar to those proposed by the YTG were adopted to control public access to the area.

On March 1, 1983, Senator Olson announced approval by the Designated Officer of the final route of the 830-km (515-mi.) section of the pipeline through Yukon, including the proposed routing through the Ibex Pass. The Minister noted that Agency officials had concluded that pipeline installations through the Ibex would not restrict the options open with respect to the point of connection of the propopsed Dempster Lateral with the mainline.

Cost-Control Procedures

Throughout the year the Agency worked closely with the staff of the National Energy Board in reviewing Foothills' estimates of the Stage I capital costs of the pipeline project. These estimates were subsequently considered at a public hearing in Ottawa, following which the National Energy Board issued its decision on the final design cost estimates that it was prepared to allow for purposes of calculating the Incentive Rate of Return. Under this incentive scheme, pipeline companies can earn a higher than normal rate of return on their equity investment in the project if actual costs are lower than the estimated costs approved by the Board and a reduced rate of return if costs exceed those estimates.

Following the completion of construction of any segment of the project, the actual capital costs are audited and again considered at a public hearing to determine whether these expenditures have been prudently incurred and, therefore, are acceptable for inclusion in a company's rate base.

The National Energy Board conducted a hearing in Ottawa in late June and early July, 1982, to examine submissions by Foothills on a number of outstanding matters.

In addition to considering the acceptability of actual construction costs previously incurred, the hearing also examined certain revisions in the final design cost estimate for the Eastern Leg which had been proposed by Foothills to reflect conceptual changes in the design and operating provisions that had been made since the Eastern Leg cost estimate had originally been submitted. These conceptual changes included the installation of a series of cross-overs to integrate the Eastern Leg with the Nova delivery system between James River and the Alberta/Saskatchewan border and the establishment of a compressor station at Richmound, Saskatchewan.

In its decision of August, 1982, the Board approved the actual filed costs for the Alberta section of the Western Leg of $93,080,000, but reduced the filed cost for the south B.C. section by $110,000 to $81,862,000. The Board reduced the revised final design cost estimate for the Eastern Leg submitted by Foothills to reflect its conceptual changes in design and operations by some $2,380,000. The NEB decision concluded that certain proposed interconnecting facilities in Saskatchewan were not required for the first phase of the project and that the allowance the company had claimed for contingencies was excessive.

Right-of-Way Issues

Plans, Profiles and Books of Reference

In early 1983, Agency staff reviewed and approved the Plans, Profiles and Books of Reference both for Yukon and the Swift River section of the pipeline route located in northern British Columbia. The plans, profiles and books of reference for a 56.5-km (35.2-mi.) portion of the mainline from James River junction to Rocky Mountain House in Alberta were also received and approved.

For Saskatchewan, the Agency received and approved a plan, profile and book of reference for the temporary Monchy bypass.

Pipeline Crossings

Agency staff reviewed and approved a number of applications by the Foothills' companies for the crossing of various highways and utilities in Alberta and Saskatchewan by the Eastern Leg. Two applications by other companies to cross Foothills' pipeline facilities in the two provinces were also reviewed and approved. In addition, Agency staff reviewed and made recommendations to the National Energy Board for crossings by other companies of Foothills' pipeline facilities operating in those areas under the Board's jurisdiction.

In preparation for a major river crossing, floats are attached to the pipe to maintain buoyancy while pulling the pipe across the body of water.

Agency staff also co-ordinated the granting of a number of approvals by other federal authorities involving pipeline crossings during the 1982 construction season. Two orders approving the crossings of navigable water in Alberta were authorized by the Ministry of Transport. The Railway Transport Committee of the Canadian Transport Commission issued orders authorizing the crossing of four railway lines in Alberta.

The International Boundary Commission also gave approval for a temporary pipeline crossing of the Canada-United States boundary near Monchy, Saskatchewan, under the *International Boundary Commission Act*.

Landowner Concerns

Agency staff continued to monitor the efforts of the various Foothills' companies to complete negotiations of damage settlements and to deal with any other concerns of landowners on the completed sections of the pipeline in Alberta, Saskatchewan and southeastern British Columbia.

The negotiation of damage settlements was largely completed by the end of the year with the exception of a few still outstanding in southeastern British Columbia.

Leave-to-take Additional Lands

Following a hearing held at Rocky Mountain House, Alberta, in November, 1981, the Designated Officer issued a number of orders authorizing Foothills to take additional lands for the purpose of constructing, maintaining and operating the pipeline along a 56.6-km (35.2-mi) section of the mainline north of Caroline, Alberta. Subsequently, two landowners launched an appeal against one of these orders of the Designated Officer in the Federal Court of Appeal, which was dismissed following a hearing in Edmonton in October, 1982.

Part of the additional lands sought by Foothills consisted of temporary working space required for construction only and the orders specified that the use of this space would end on December 31, 1983. Since

Sideboom tractors lower the pipe into the river bed during Eastern Leg construction.

construction of this section was later deferred, the time limitation specified in the orders would have had the effect of making the temporary working space unavailable to Foothills. In mid-November, 1982, the company applied to have the expiry dates for the use of the temporary working space extended two years from the date on which leave-to-proceed with construction was granted.

Subsequently, Foothills notified affected landowners of its new application and the reasons for it and in January, 1983, Agency officials met with certain of those landowners to discuss the company's revised proposal. There having been no other submissions, the Designated Officer later issued amending orders authorizing use of the temporary working space for a period of two years from the time leave-to-proceed with construction of the pipeline was granted in the area within which the lands are situated.

Route Hearings

Following service on landowners in Yukon and in the Swift River area of northeastern British Columbia of the landowners' Information Booklet in December, 1980, and January, 1981, three holders of quartz mineral claims objected to the proposed pipeline route in the Ibex Pass area of Yukon.

In mid-February, 1983, the Designated Officer of the Agency heard the representations of the claim holders and of Foothills. Three route orders defining the pipeline route across the quartz mineral claims were issued later that same month. Subsequently, Foothills and one of the claim holders reached agreement as to a minor route realignment and this agreement was concurred in by the Designated Officer.

Construction crews prepare to lower the pipe into the river bed during Eastern Leg construction.

Finance, Personnel and Official Languages

Finance and Personnel

Section 12 of the *Northern Pipeline Act* provides for an annual audit of the accounts and financial transactions of the Agency by the Auditor General of Canada and for a report thereon to be made to the Minister. Section 13 of the Act requires the Auditor General's report to be laid before Parliament together with the Minister's annual report on the operations of the Agency. To comply with these requirements, the report of the Auditor General of Canada on the accounts and financial transactions of the Northern Pipeline Agency for the year ended March 31, 1983, is reproduced as Appendix A to this report.

Estimates for 1982-83 provided $9.5 million for the operation of the Agency. Actual expenditure was $6.7 million, $2.8 million less than the amount approved by Parliament. The number of person-years authorized for 1982-83 amounted to 134, of which only 90 were used. The shortfall in expenditure and manpower utilization reflected the continued delay in the scheduled start of construction of the northern segments of the Alaska Highway Gas Pipeline Project and the reduction of planning activities by Foothills and, consequently, of the Agency.

Section 29 of the *Northern Pipeline Act* provides for recovery of the costs of the Agency from the company constructing the pipeline in accordance with regulations made under subsection 46.1 (2) of the *National Energy Board Act*. During the year, recoveries totalling $7.5 million were made. Of this total, $6.9 million was recovered from Foothills in keeping with the provisions of the *Northern Pipeline Act*, which represented the unrecovered balance from the previous fiscal year and part of 1982-83 expenditures by the Agency. In addition, $600,000 was recovered from various other departments and agencies of the federal government to which certain NPA employees had been seconded following the phasing down of Agency activities that was begun early in the fiscal year because of the further delay encountered in proceeding with Phase II construction of the project. All recoveries were credited to the Consolidated Revenue Fund.

Official Languages Plan

Although the Northern Pipeline Agency is a separate employer under Part II of the *Public Service Staff Relations Act* and is not subject to the *Public Service Employment Act*, the language policies and procedures established for other government departments and agencies have generally been applied. In addition, the Agency conforms as fully as possible with the provisions of the *Official Languages Act*.

Enquiries of the Agency are answered in the language chosen by the enquirer and publications are available in both official languages. Employees in Ottawa, 43 per cent of whom have French as their first official language, may work and receive service in the language of their choice. Within the merit principle, every reasonable effort is made to balance the participation of both linguistic communities, including the advertisement of competitions through media serving the official languages minorities. The working language of the Calgary office is English, but it is the policy of the Agency to ensure that a minimum of two employees, one officer and one member of support staff, are qualified and available to provide service to the public in the French language.

These policies are contained in the Agency's Official Languages Plan and are being monitored each year.

In order to allow members of the public to comment on the linguistic aspect of services provided, enquiries may be made by telephoning (613) 593-7466 or by writing to the Head Office, the address of which is shown in Appendix D to this report.

Taking Stock

A Look Back on the First Five Years
by Commissioner Mitchell Sharp

With the completion of first-stage construction of the Alaska Highway Gas Pipeline and the further delay in proceeding with the challenging second stage in the North, this seems to be an appropriate time and place in which to review the operations of the Northern Pipeline Agency in relation to the tasks assigned to it by the *Northern Pipeline Act*—particularly its role as a 'single window' for the regulation of the project at the federal level.

The basic provisions for carrying out the joint construction in Canada and the United States of the project were embodied in the agreement between the two governments that was signed in September, 1977, following years of intensive study.

The *Northern Pipeline Act*, which came into force in April of 1978, served as a means of both implementing the provisions of the bilateral Canada-U.S. agreement and of bringing into being the Northern Pipeline Agency as the primary instrument for achieving the objectives of the project in this country that had been laid down by the government and Parliament.

With the passage of time, the circumstances that led to the formulation of those objectives, and the establishment of the Agency to do everything possible to ensure that they were met are sometimes forgotten. It is important to remember, therefore, that to a very considerable extent the provisions of the *Northern Pipeline Act* were aimed at avoiding a repetition in the case of the Alaska Highway Gas Pipeline of the harsh experiences encountered earlier in the 1970s in connection with the building of the 800-mile Trans-Alaska oil pipeline from Prudhoe Bay on the North Slope of Alaska to Valdez on the south coast. These adverse impacts resulted from inadequate research and planning required to identify and overcome major technical problems in the design and engineering of the pipeline and to minimize adverse environmental impacts, a failure on the part of the project sponsor and governments to take steps to prevent the limited social infrastructure of Alaska from being overwhelmed by the massive influx of people associated with the project, inadequate initial planning to take account of the undertaking as it affected the interests of native people, and delays and confusion created by a lack of coordination of the many federal and state government departments and agencies involved. The widespread concern in this country that every effort should be made to avoid a repetition of these adverse experiences in the building of a gas pipeline through Canada was reflected in such reports as those of the Berger, Lysyk and Hill Inquiries and of the National Energy Board and, of course, in the extensive debates on the question in Parliament.

Apart from its purpose of implementing the terms of the bilateral agreement with the United States, the *Northern Pipeline Act* laid down two basic objectives in connection with the undertaking of the pipeline project in Canada. One was to facilitate its efficient and expeditious planning and construction. The other was to ensure that planning and construction were carried out in a way that would avoid or minimize any adverse socio-economic and environmental impacts while at the same time maximizing the economic benefits of the undertaking both regionally and nationally. In particular, the legislation stipulated that special account was to be taken of the interests of people—especially native people—living within the vicinity of the pipeline.

The establishment by Parliament of the Northern Pipeline Agency as the primary instrument at the federal level for implementing these basic objectives represented a unique experiment. This was an experiment many groups had advocated as a means of trying to ensure that the adverse experiences in the building of the oil pipeline in Alaska would not be repeated

when it came to building a 2,000-mile gas pipeline from the Alaska-Yukon border to Canada's border with the lower 48 states.

The Northern Pipeline Agency was created essentially to serve as a 'single window' through which federal authorities concerned with the project could deal with the Canadian sponsor, Foothills Pipe Lines (Yukon) Ltd., with provincial and territorial governments involved in the project, and with U.S. jurisdictions dealing with the design and construction of the pipeline. (In certain areas, however, the National Energy Board also exercises an important degree of authority with respect to the pipeline in Canada—for example, in determining permissible tolls and tariffs.)

I must acknowledge that the major challenges the Agency was basically established to overcome—social, environmental, economic, technical—concern the building of the pipeline in the Far North and, hence, still lie ahead. Only the future will tell how well we have prepared, how well we have planned. Nevertheless, the Agency has acquired extensive experience over the past five years not only in overseeing the planning to date of the entire pipeline, but also construction of the first stage of the system in Canada—an undertaking that involved an investment of nearly $1 billion. Based on that experience, I believe the approach adopted by Parliament of establishing the Northern Pipeline Agency as a 'single window' for the regulation at the federal level of such a massive and complex project that touches the lives of so many people has proved to have been a wise one.

To assist it in carrying out the many facets of its mandate, the Agency has been made up of staff having a broad range of professional and technical skills. Its personnel has included geotechnical and pipeline engineers, right-of-way specialists, scheduling experts, a fisheries biologist, an hydrologist and other environmental scientists, officers skilled in maintaining surveillance with respect to engineering and environmental concerns during the course of actual construction, accountants, and other experts in such fields as socio-economic concerns, logistics, communications, manpower planning and labour relations, and procurement practices. While the Agency functioned in a number of respects as a regular department of government, the status conferred on it as a separate employer greatly facilitated the Agency's ability to recruit the skilled personnel it required.

As I indicated earlier, one of the primary objectives laid down in the *Northern Pipeline Act* was that everything reasonably possible be done in the planning, construction and operation of the project in Canada to maximize regional and national economic benefits and to minimize adverse social and environmental impacts. To achieve that objective, one of the early tasks of the Agency was the development of detailed socio-economic and environmental terms and conditions covering the various segments of the pipeline in this country. These terms and conditions were the subject of extensive consultation with other levels of government concerned with the undertaking and various interest groups. In Yukon and northern British Columbia they were also the subject of a number of public hearings.

In addition to these socio-economic and environmental terms and conditions, the Agency also established a number of technical conditions that Foothills was required to meet in order to ensure the safety and integrity of the pipeline system.

The engineering challenge posed by the building of the more than 3 000 km (2,000 mi.) of the pipeline system in Canada is made all the greater by the fact that a significant portion of the route in the far northern area is composed of continuous and discontinuous permafrost, which poses problems of frost heave and thaw settlement that could cause the pipe to rupture in the absence of off-setting measures. As I have already indicated, the Agency's technical orders place specific requirements on Foothills to meet engineering criteria and, similar to the socio-economic and environmental terms and conditions, to submit detailed plans and proposals for approval by the Designated Officer of the Agency.

Subsequently, a good deal of the work of the Agency was concerned with overseeing the development of plans by Foothills for compliance with these socio-economic and environmental terms and conditions and technical requirements throughout the length of the system in this country and overseeing their implementation with respect to the construction and later operation of the Western and Eastern Legs.

As a general pattern, the companies in each segment have been required to provide detailed plans indicating the steps they propose to follow in order to comply with the terms and conditions and technical requirements. These plans, in turn, have been approved by the Agency (in most cases, following review and comment by other government bodies and interest groups) and enforced by its surveillance staff. During Phase I construction in Saskatchewan, Alberta and southeastern British Columbia, I believe the terms and conditions and plans proved effective in accomplishing the objectives of the legislation.

The *Northern Pipeline Act* required Foothills to prepare two specific plans for the approval of the Minister responsible for the Agency. One was a Procurement

Plan by which the company spelled out the steps it intended to take to ensure that the project achieved the maximum input of Canadian goods and services that was practicable and the greatest possible stimulus to domestic research, development and expansion of the industrial base. The other requirement was for the submission of a Manpower Plan under which Foothills detailed the measures it intended to adopt so as to ensure the greatest possible employment of Canadian workers in the planning, construction and operation of the system.

The Procurement Plan submitted by the company in keeping with the provisions of the *Northern Pipeline Act* has subsequently become a model for other federal departments and agencies with respect to certain other major industrial projects. In the construction of the first stage of the Foothills system, Canadian content in terms of value added amounted to 87 per cent on the Eastern Leg and 91 per cent on the Western Leg. The first phase of the project also produced a number of important industrial benefits, including development of a world-scale burst testing facility for pipe in Alberta and another at Quill Creek in Yukon to assist in the development of construction and design techniques capable of resolving problems of routing the pipeline through areas of discontinuous permafrost, development of a new revegetation machine known as the Hodder Gouger, the large-scale use of automatic welding machines, and the establishment of facilities for manufacturing of turbo-machinery in Canada and the expansion of facilities for the manufacture of large valves and fittings.

Supplementing the Manpower Plan developed by Foothills for the maximum employment of Canadian labour in the planning, construction and operation of the project were additional plans for training qualified residents in adjacent areas who wished to obtain employment on the project and the adoption of affirmative action plans aimed at providing employment opportunities for native people and women. While results from the Manpower Plan and related plans were substantial on Phase I, the real benefits of these measures are expected to be realized when Phase II is commenced. Inventories of available persons and skills—never previously available—have already been made in Yukon and northern British Columbia in anticipation of mainline construction.

The *Northern Pipeline Act* requires that the interests of native people be taken into account in the planning and construction of the pipeline and that native land claims, as they might affect the construction of the pipeline, be dealt with in a just and equitable manner. The Agency attempted with some success to establish close relations with native associations and groups and, through extensive consultations and two public hearings, obtained their views. Much of this work related to Phase II, but significant results were achieved during the first stage. This was particularly the case with respect to native employment on construction, which amounted to more than six per cent of person-days. This percentage equates well to the representation of native people in the provinces concerned. As construction moves north, greater participation is expected.

Native land claims in Yukon were carefully taken into account during the selection of the final route for the pipeline and many changes were made in response to direct concerns expressed by the native people. While the selection of the exact route of the pipeline is less advanced in northern British Columbia and Alberta, active information and consultation programs with native groups are under way.

To enable it to carry out its function as a regulatory body that would serve as a 'single window' on behalf of the federal government, the Northern Pipeline Agency was granted extensive authority under the *Northern Pipeline Act*. This capacity of the NPA to operate as a 'single window' was reinforced by the further provisions in the legislation that provided for the transfer to the Agency of additional powers related to the pipeline from other federal departments and agencies, including the delegation of substantial regulatory authority from the National Energy Board and the appointment as Designated Officer and Deputy Administrator of the Agency of an Associate Vice-Chairman of the Board. While certain federal bodies retained responsibility for some specific aspects of the project, the Agency developed close and effective working relationships with them.

Although the Northern Pipeline Agency possesses extensive authority with respect to the pipeline project in areas coming under federal jurisdiction, it has from the beginning made a concerted effort to operate to the greatest extent possible at the federal level through consultation and co-operation with other interested departments and agencies.

A similar approach has also characterized the Agency's dealings with many other governments, organizations and special interest groups concerned with the project. This has involved extensive meetings with U.S. authorities, with officials of provincial and territorial governments, with native and other special interest groups, with municipalities, with suppliers, with labour unions, with landowners and, of course, with the segment companies of Foothills. Proposed environmental and socio-economic terms and conditions, and plans developed as part of those terms and conditions,

were made available to all interested parties and the public for comment before being approved by the Agency. Public hearings were also held in Yukon and northern and southern British Columbia to review draft terms and conditions and other issues.

Advisory Councils representative of the regions were established in northern British Columbia and Yukon to provide the Minister with the benefit of their counsel based on their knowledge and experience of local conditions and circumstances. As provided for in the Act, a Federal-Provincial-Territorial Consultative Council was also created to facilitate co-ordination and co-operation between these jurisdictions. In addition, the House of Commons and the Senate took the unique step of establishing special committees to monitor the entire project and oversee the operations of the Northern Pipeline Agency.

To keep in contact with the communities along the pipeline route and to inform the interested public, the Agency conducted numerous initiatives, including a monthly publication titled "Pipeline", which was widely distributed.

Undoubtedly all of these endeavours on the part of the Agency that I have just outlined will be resumed in full measure once activity leading to the commencement of second-stage construction of the pipeline again begins to gather momentum. Meanwhile, however, this—as I noted at the outset—has seemed to be a good time and place in which to take stock of what has been accomplished to date through the unique approach adopted some five years ago by Parliament in an effort to provide effective and efficient direction and control over a massive and complex project that in one way or another has the potential to affect the interests of millions of Canadians.

AUDITOR GENERAL OF CANADA

VÉRIFICATEUR GÉNÉRAL DU CANADA

AUDITOR'S REPORT

Senator the Honourable H.A. (Bud) Olson, P.C., M.P.,
Minister responsible for the Northern Pipeline Agency

I have examined the statement of expenditure and receipts of the Northern Pipeline Agency for the year ended March 31, 1983. My examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as I considered necessary in the circumstances.

In my opinion, this statement presents fairly the expenditure and receipts of the Agency for the year ended March 31, 1983 in accordance with the accounting policies set out in Note 2 to the statement, applied on a basis consistent with that of the preceding year.

Kenneth M. Dye, F.C.A.
Auditor General of Canada

Ottawa, Ontario
September 15, 1983

NORTHERN PIPELINE AGENCY

Statement of Expenditure and Receipts
for the year ended March 31, 1983

	1983	1982
Expenditure (Note 3)		
Salaries and employee benefits	$4,789,364	$4,519,297
Rentals	733,354	838,042
Travel and communication	542,788	809,405
Professional and special services	351,217	518,743
Material and supplies	114,623	221,474
Furniture and equipment	48,227	97,744
Information	44,257	73,707
Other	66,051	58,547
	6,689,881	7,136,959
Receipts		
Recovery of costs from Foothills Pipe Lines (Yukon) Ltd. (Note 4)	6,893,422	7,137,897
Secondment of Agency staff	609,759	—
Other recoveries	8,024	38,306
	7,511,205	7,176,203
Excess of receipts over expenditure	$ 821,324	$ 39,244

Approved by:

Commissioner

Chief Financial Officer

NORTHERN PIPELINE AGENCY

Notes to Statement of Expenditure and Receipts
March 31, 1983

1. Authority and objective

The Agency was established in 1978 by the Northern Pipeline Act (S.C. 1977-78, c. 20). The objective of the Agency is to facilitate the efficient and expeditious planning and construction of the Alaska Highway Gas Pipeline in a manner consistent with the best interests of Canada as defined in the Act.

2. Accounting policies

Expenditure

Expenditure includes the cost of work performed, goods received or services rendered prior to April 1, except for the costs of the employees' contingency and termination plans which are charged to expenditure when paid. Capital acquisitions are charged to expenditure in the year of purchase. Expenditure also includes any costs incurred on behalf of the Agency by government departments, except for contributions to employee benefit plans which are based on budgeted salary costs. All expenditure is financed by parliamentary appropriations and government departments which provided services without charge.

Receipts

Receipts are recorded on a cash basis and are credited to the Consolidated Revenue Fund. Recovery of costs from Foothills Pipe Lines (Yukon) Ltd. is based on quarterly billings.

3. Expenditure

Expenditure for the year was provided for as follows:

	1983	1982
Parliamentary appropriations		
Economic Development		
Vote 5—Program expenditures	$8,871,000	$8,474,000
Statutory—Contributions to employee benefit plans	654,000	595,000
	9,525,000	9,069,000
Lapsed in accordance with Section 30 of the Financial Administration Act and Treasury Board Circular 1979-41	(2,835,119)	(1,935,509)
	6,689,881	7,133,491
Government departments which provided services without charge	—	3,468
	$6,689,881	$7,136,959

4. Recovery of costs from Foothills Pipe Lines (Yukon) Ltd.

	1983	1982
Costs recoverable for the year		
Expenditure for the year	$6,689,881	$7,136,959
Adjustment in respect of employee benefits	(641,000)	—
Secondment of Agency staff	(609,759)	—
Other recoveries	(8,024)	(38,306)
	5,431,098	7,098,653
Costs to be recovered in the following year	(455,647)	(1,917,971)
Prior year costs recovered in the current year	1,917,971	1,957,215
	$6,893,422	$7,137,897

The Agency's share of employee benefits paid to the government since 1978 has exceeded the actual employer's share. As a result, costs recoverable for the year have been adjusted accordingly.

5. Employees' contingency and termination plans

Contingency plan

Senior and certain other key employees who remain with the Agency until completion of their responsibilities and whose service exceeds two years are entitled to an allowance of 13% of accumulated salary received. Based on employees on strength who may become entitled to this benefit in the future, unpaid costs as at March 31, 1983 are estimated at $105,000 (1982—$695,000).

Termination plan

On July 15, 1982, Treasury Board approved a termination plan for employees who are separated due to the reduction of activities since May 1, 1982. The amount of termination allowance is based on years of service and includes an amount for relocation as necessary. Based on projected terminations unpaid costs as at July 26, 1983, are estimated at $1,780,000, including relocation costs.

6. Reduction of activities

On May 1, 1982, the United States sponsors of the Alaska Highway Gas Pipeline and Foothills Pipe Lines (Yukon) Ltd. announced that the target date for completion had been set back two years to 1989 and all parties were to scale down their activities to correspond to a revised construction schedule.

The Agency was able to reduce staff costs through secondments to other departments and by terminations for 45 employees during the latter part of the year. Certain other costs were also reduced during the year and certain excess space has been released.

In June 1983, Foothills Pipe Lines (Yukon) Ltd. announced a further reduction in its activities and over the next year, the Agency will make further reductions to scale down its activities to correspond to those of Foothills Pipe Lines (Yukon) Ltd.

The Role of the Northern Pipeline Agency

The Northern Pipeline Agency was established with the proclamation of the *Northern Pipeline Act* on April 13, 1978, for the purpose of overseeing the planning and construction of the Canadian portion of the Alaska Highway Gas Pipeline to provide access to the substantial Arctic natural gas reserves of both Canada and the United States.

In addition to creating the Agency, the Act provides the legislative authority required to implement the bilateral agreement of September 20, 1977, between the two nations, which governs the joint undertaking of the 9 000-km (5,500-mi.) system. A brief description of this system can be found in Appendix C.

The Agency was created as the principal instrument for carrying out the objects of the legislation approved by Parliament. The Agency's mandate is twofold. It is required to regulate the project and to facilitate the efficient and expeditious planning and construction of the system in Canada by the Foothills Group of Companies. It is also required to ensure that the project is carried forward in a way that will yield the maximum economic, energy and industrial benefits for Canadians with the least possible social and environmental disruption. In particular, the Agency is directed by the Act to take account of the local and regional interests of residents, especially native residents, in areas affected by the undertaking.

In an unprecedented step, the House of Commons in April, 1978, agreed to the establishment of a Standing Committee on Northern Pipelines to maintain continuing surveillance over the implementation of the *Northern Pipeline Act* and the operations of the Northern Pipeline Agency. The Committee has conducted several meetings following its formation in June of that same year to hear testimony from senior officers of the Agency and of the Canadian and United States project companies, as well as others.

In June, 1978, the Senate also adopted a motion for the establishment of a Special Committee on the Northern Pipeline with authority to "inquire into all matters relating to the planning and construction of the pipeline for the transmission of natural gas from Alaska and Northern Canada...". The Senate Committee also has held a number of hearings related to the project since its formation.

The Northern Pipeline Agency was established to provide a "single window" for the conduct of virtually all dealings at the federal level with the Foothills Group of Companies, which was authorized under the Act to undertake the project in Canada. In keeping with the provisions of the legislation, many of the regulatory powers of other federal departments and agencies relating to the planning, construction and operation of the Canadian system have been transferred to the Northern Pipeline Agency. The principal exception involves responsibilities reserved exclusively to the National Energy Board or shared between the Board and the Agency. In addition, the Agency is responsible for facilitating the co-ordination of activities bearing on the project that involve other arms of the federal government, other levels of government in Canada, and U.S. departments and agencies.

The management and direction of the Agency come under the authority of a Minister designated for this purpose by the Governor in Council. A Commissioner appointed by Order in Council serves under the Minister as his deputy in charge of the Agency. The Commissioner is based at the head office in Ottawa. The main operational office is located in Calgary and functions under the direction of an Administrator appointed by Order in Council, who is also responsible for the day-to-day direction of regional offices located in Vancouver, British Columbia, and Whitehorse, Yukon Territory. As provided for under the Act, a member of the National Energy Board serves as its Designated Officer, and also as a Deputy Administrator of the Agency. The Designated Officer exercises the powers of the Board that were delegated by it on July 27, 1978. Following a further delegation of authority from the Board in September, 1981, the Designated Officer also exercises those powers contained in Parts I, II and III of the Gas Pipeline Regulations with respect to the Alaska Highway Gas Pipeline. A list of the senior officers of the Agency as of the end of the fiscal year and the location of Agency offices can be found in Appendix D on Page 30.

Project Description

The Alaska Highway Gas Pipeline Project is a large-diameter system that will initially transport natural gas from the North Slope of Alaska across Canada to the lower 48 states. It will also provide access through the Dempster Lateral to Canada's own reserves in the Mackenzie Delta-Beaufort Sea area of the Northwest Territories as and when they are required.

In 1980, Canadian and U.S. authorities approved the early construction of the Western and Eastern Legs that make up the southern portions of the system initially to permit the export of surplus Canadian gas to U.S. markets. A brief outline of this first-stage construction is given below.

Foothills Pipe Lines (Yukon) Ltd. of Calgary, Alberta, is the parent company responsible for the Canadian portion of the project. It is owned equally by Nova, An Alberta Corporation, of Calgary, Alberta, (formerly known as the Alberta Gas Trunk Line Company Ltd.), and Westcoast Transmission Company Ltd., of Vancouver, British Columbia.

The mainline system in Canada has been or will be built in five segments by the following subsidiary companies:

Foothills Pipe Lines (South Yukon) Ltd.
Foothills Pipe Lines (North B.C.) Ltd.
Foothills Pipe Lines (Alta.) Ltd.
Foothills Pipe Lines (South B.C.) Ltd.
Foothills Pipe Lines (Sask.) Ltd.

A sixth subsidiary, Foothills Pipe Lines (North Yukon) Ltd., will build the Dempster Lateral if and when it is approved by the National Energy Board.

In the United States, the Alaskan segment will be built and operated by the Northwest Alaskan Pipeline Company on behalf of the Alaskan Northwest Natural Gas Transportation Company. South of the 49th parallel, Northern Border Pipeline Company, a consortium made up of four U.S. transmission companies and one Canadian company, TransCanada PipeLines Ltd., has already constructed most of the planned Eastern Leg of the system. Two California companies—Pacific Gas Transmission Company and its parent corporation, Pacific Gas and Electric Company—have completed first-stage construction on the Western Leg in the United States.

The mainline project will comprise almost 7 720 km of pipe in the two countries. The diameter of the pipe will be of 1 422, 1 219, 1 067 and 914 mm. A total of approximately 3 270 km will be in Canada, 1 180 km in Alaska and 3 270 km in the United States south of the 49th parallel.[1] An additional 1 200 km of 860 mm pipe will be laid when and if the Dempster Lateral is approved.

The mainline through Canada will consist of the following lengths and diameters.[2]

Yukon	375 km of 1 219 mm
	443 km of 1 422 mm
B.C. (North)	715 km of 1 422 mm
Alberta	634 km of 1 422 mm
	377 km of 1 067 mm
	301 km of 914 mm
Saskatchewan	258 km of 1 067 mm
B.C. (South)	171 km of 914 mm

The pipeline in Alaska will be approximately 1 180 km of 1 219 mm pipe. In the lower 48 states, the Eastern Leg will consist of almost 1 800 km of 1 067 mm pipe and the Western Leg will involve about 1 470 km of 1 067 mm line.[3]

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[1] The total project will comprise almost 4,790 miles of 56-, 48-, 42- and 36-inch pipe. Approximately 2,030 miles will be in Canada, 730 miles in Alaska and 2,030 miles south of the 49th parallel. The Dempster Lateral would comprise approximately 746 miles of 34-inch pipe.

[2]

Yukon	233 mi. of 48 in. 275 mi. of 56 in.	Saskatchewan	160 mi. of 42 in.
B.C. (North)	444 mi. of 56 in.	B.C. (South)	106 mi. of 36 in.
Alberta	334 mi. of 56 in. 234 mi. of 42 in. 187 mi. of 36 in.		

[3] The pipeline in Alaska will be approximately 730 miles of 48-inch pipe. In the lower 48 states, the Eastern Leg will consist of almost 1,120 miles of 42-inch pipe and the Western Leg will involve about 911 miles of 42-inch line.

The system is designed so that when fully powered it would be able to carry 68 million cubic metres per day (2.4 billion cubic feet per day) of Alaskan gas and, if the Dempster Lateral is approved, an additional 34 million cubic metres per day (1.2 billion cubic feet per day) of Canadian Mackenzie Delta-Beaufort Sea gas.

The capital costs for the entire system, excluding those for the Dempster Lateral from the Mackenzie Delta and the gas conditioning plant at Prudhoe Bay, Alaska, were originally estimated to be $10.7 billion (Cdn.). This estimate reflected a cost of $4.3 billion for the Canadian segments and $6.4 billion for the U.S. segments. These estimates were based on the assumption that the entire system would be completed and ready to go into operation by January, 1983, as provided for in the timetable envisaged in the Canada-United States Agreement.

In testimony prepared for the congressional committee hearings on the U.S. legislation waivers in October, 1981, John G. McMillian, Chairman of the Alaskan Northwest Natural Gas Transportation Co., indicated that approximately $38.7 billion to $47.6 billion (U.S.) would be required to construct the entire system in both countries, including the gas conditioning plant and the $2.4 to $2.7 billion estimated for first-stage construction. Estimates of the amounts needed for financing purposes were based on a range of inflation and interest rates in the United States from 7 per cent to 11 per cent and 10 per cent to 14 per cent, respectively, and on a revised-in-service date of late 1986.

A submission by Foothills Pipe Lines (Yukon) Ltd. to the congressional committee hearings estimated that approximately $17.6 billion on an escalated basis would be required to finance the entire Canadian section, based on a late 1986 completion date. Foothills subsequently indicated in testimony before the Special Committee of the Senate on the Northern Pipeline in May, 1982, that the Canadian sections would cost approximately $19 billion (Cdn.) in as-spent dollars given a 1987 completion date.

The pipeline sponsors in Canada and the United States had yet to file revised cost estimate with their respective regulatory authorities by the end of the fiscal year under review to reflect the futher extension of the completion date to late 1989.

The map found on page vi provides a description of the proposed pipeline route.

First-Stage Plan for Construction of the Southern Sections

The first-stage plan provided for construction in Canada and the United States of all or part of the proposed Western and Eastern Legs of the system from the point where they branch off from the main line 105 km (63 mi.) north of Calgary, Alberta.

The first-stage program involves the laying of some 2 992 km (1,858 mi.) of pipe in Canada and the United States, of which 850 km (526 mi.) are in Canada. Capital costs are estimated at approximately $1.4 billion (U.S.) for the American section and $928 million (Cdn.) for the Canadian. Costs for the Canadian sections include provision for actual funds used during construction, as well as certain other expenses associated with regulatory charges. The system will be capable of transporting some 32.11 million cubic metres (1.14 billion cubic feet) of Alberta gas a day to U.S. markets, rising to a possible peak flow between 1983 and 1986 of 38.03 million cubic metres (1.35 billion cubic feet).

Construction of the Western Leg in Canada, which began in August, 1980, involved the installation of seven loops over a distance of 215 km (132 mi.) of pipe, 914 mm (36 in.) in diameter. Work on this section was completed in the spring of 1981.

Construction of the U.S. Western Leg, which began in December, 1980, involved the installation of 258 km (160.5 mi.) of loops to the Pacific Gas Transmission pipeline from the Canadian border point at Kingsgate, B.C., to Stanfield, Oregon. From Stanfield, the Canadian gas is being transported to southern California through the addition of some 565 km (361 mi.) of loops to Northwest Pipelines and El Paso Natural Gas, which has been designated the Western Delivery System. For purposes of transmission of Alaskan gas on the Western Leg, the Pacific Gas Transmission and Pacific Gas and Electric systems will be further extended from Stanfield to Antioch, California, which is close to San Francisco. On October 1, 1981, gas began to flow through the Western Leg to U.S. markets.

The Eastern Leg, in Canada and the United States, is comprised of 1 956 km (1,215 mi.) of 1 067-mm (42-in.) pipe. Construction began in both countries in May, 1981, and was to be completed over a two-year construction period. Gas began to flow through the system on September 1, 1982.

Northern Pipeline Agency

Senior Officers and Office Locations

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Mr. Harold S. Millican, Administrator,
Mr. William A. Scotland, Deputy Administrator and
Designated Officer,
Mr. A. Barry Yates, Deputy Administrator.

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