

FERC -

3/16/79

NOTICE OF
APPLICATION

UNITED STATES OF AMERICA
 FEDERAL ENERGY REGULATORY COMMISSION

FERC

Alaskan Northwest Natural Gas) Docket No. CP78-123, et al.
 Transportation Company)

NOTICE OF APPLICATION *APPENDIX*

(March 16, 1979)

Take notice that on March 2, 1979, Alaskan Northwest Natural Gas Transportation Company (the Partnership)^{1/}, P.O. Box 1526, Salt Lake City, Utah 84110, filed in Docket No. CP78-123, et al., an application pursuant to the Alaska Natural Gas Transportation Act of 1976 (ANGTA), the Natural Gas Act, the Decision and Report to Congress on the Alaska Natural Gas Transportation System as ratified by Congress (President's Decision) and the Commission's order vacating prior proceeding and issuing conditional certificate of public convenience and necessity, issued December 16, 1977, for an order approving the design specifications and initial system capacity of the Alaskan segment of the Alaska Highway Pipeline Project, all as more fully set forth in the application which is on file with the Commission and open to public inspection.

The President' Decision described the facilities necessary for the construction and initial operation of the system as follows:

-
- 1/ The application indicates that the Partnership is successor to Alcan Pipeline Company (Alcan) which filed its application with the Federal Power Commission (FPC) for authorization to construct a 42-inch pipeline in Alaska to be designed and operated at a maximum working pressure of 1260 psig. This proposal was amended to provide additional expansibility by increasing the pipeline diameter to 48 inches at the same design pressure, it is said.

Docket No. CP⁷³-123, et al.

"...The facilities which are to be covered are those in the U.S. which are adequate for a throughput of up to 2.4 bcf/d and are included in the revised Alcan filing submitted to the Federal Power Commission (FPC) in March 8, 1977. If any modifications to those facilities are required by the Agreement on Principles between the U.S. and Canada, those modified facilities will also be entitled to the expedited authorization process in Section 9." (p. 13)

"The gas transportation system will utilize a 48-inch diameter pipeline from Prudhoe Bay to James River, Alberta." (p. 13)

"Peak-day capacity utilizing nine compressor stations will be 2.6 bcf/d, with an average daily volume of 2.4 bcf/d. By installation of intermediate compressor stations, the system could be increased to 3.4 bcf/d peak capacity, with an average day capacity of 3.2 bcf/d. The system capacity could be further increased by addition to the compressor horsepower at each station." (p. 17)

The Partnership summarizes its position as follows:

The Partnership requests an order from the Commission approving the design specification for the 48-inch pipeline with a maximum working pressure of 1260 psig and compressor station size and spacing for an initial capacity of 2.0 to 2.4 Bcf/d expandable by the addition of intermediate compressor stations to an average daily volume of 3.2 Bcf/d. This proposal is the same as was submitted to the Federal Power Commission in March, 1977.

The modification of facilities resulting from implementation of the Agreement on Principles did not affect the Alaskan segment of the project. The pipeline design in Canada commencing at the Alaska/Yukon border and continuing 260 miles to Whitehorse, Yukon, is a 48-inch pipeline with a maximum design pressure of 1260 psig; therefore, any increase in pressure of the Alaskan segment must consider the effect on the Canadian section of the project.

There are two reasons that the pressure for the Alaskan segment of the system might be increased. First is the expectation that the volumes of gas available from new reserves (other than the presently proven reserves in the Prudhoe Bay Unit) with as reasonable period of time after deliveries commence is high enough that a higher pressure system might result in lower transportation costs over the life of the project. Second is the desirability of carrying

Docket No. CP78-123, et al.

larger quantities of hydrocarbon liquids in the gaseous phase by increasing the design pressure. The State of Alaska has made available to the Partnership a recent proposal by Earth Resources Company of Alaska to move the location of the conditioning plant from Prudhoe Bay to Fairbanks, Alaska. To avoid building any conditioning facility at Prudhoe Bay the pressure of the pipeline system from Prudhoe Bay to Fairbanks would be increased to 1680 psig which, it is claimed, would accommodate all hydrocarbon liquids. At Fairbanks the plant would not only condition the gas for further transportation by removing carbon dioxide and sufficient hydrocarbon liquids to meet the requirements of the design pressure of 1260 psig to be utilized thereafter in Alaska and in a portion of the Yukon, Canada, but also would remove from the stream most of the ethane and all heavier hydrocarbons. These hydrocarbons would either be utilized within the state, such as for petrochemical development, or delivered by a new pipeline system to tidewater (Cook Inlet) for delivery to U.S. or foreign markets. The State of Alaska has requested that the Partnership delay its filing originally planned for February 1, 1979, in order to address the feasibility of this proposal. ...

The Partnership has concluded and will show herein that the proposed system is the best economic selection for delivery volumes up to 3.4 Bcfd and that there is no new evidence that this expansibility above the expected 2.0 Bcfd to be delivered from the presently proven reserves is inadequate.

As to liquid hydrocarbon carrying capacity the following conclusions are pertinent: (1) the pipeline design at 1260 psig can transport all of the ethane and propane that is available from the conditioning plant. The ethane would be the raw material for any in-state petrochemical development; therefore, the system design permits complete flexibility for ethane extraction in the future to meet the State of Alaska needs, (2) the increase in hydrocarbon liquids, primarily butane, that can be transported in the pipeline by increasing the pressure is about 5-11 thousand barrels per day and is a small volume in relation to the total oil and gas energy to be delivered which has alternative beneficial uses on the North Slope of Alaska, and (3) the increased volume of liquids that could be transported must be extracted in Alaska since the design pressure as approved by appropriate regulatory authorities in the first Canadian section is 1260 psig.

The Partnership has analyzed the proposal by Earth Resources Company of Alaska and has concluded that the necessary result of this proposal will render the primary pipeline project infeasible and, therefore, it should not be given further consideration.

Docket No. CP78-123, et al.

In reviewing the design pressure decision the Partnership states that it has considered the following alternatives to the proposed system:

1. A 48-inch pipeline design for a maximum working pressure of 1400 psig. This system would result from the increase in the pipeline safety code requirement of 72 percent of the calculated design pressure to 80 percent. This alternative would require a change in the pipeline safety code or a waiver by the Department of Transportation. A portion of the system which follows the Haul Road would require a double waiver that the Department of Transportation has indicated would not be granted.
2. A 48-inch pipeline with a maximum working pressure of 1440 psig.
3. A 48-inch pipeline with a maximum working pressure of 1680 psig.

It is indicated that the present proposed system provides capacity equivalent to any of the competitive proposals which were considered by the Commission and the President and that the Partnership is not aware of any changes in circumstances or new additional gas reserve potential which would require reconsideration of the ultimate capacity to be provided by the pipeline system within Alaska.

Accordingly, the Partnership requests that the Commission issue an order accepting the design specifications for the system selected by the President for a 48-inch pipeline with the maximum working pressure of 1260 psig providing an initial system capacity of 2.0 to 2.4 Bcfd with expansibility by the addition of intermediate compressor stations up to 3.2 Bcfd for the Alaskan segment of the Alaska Highway Pipeline Project.

Any person desiring to be heard or to make any protest with reference to said application should on or before April 5, 1979, file with the Federal Energy Regulatory Commission, Washington, D.C. 20426, a petition to intervene or a protest in accordance with the requirements of the Commission's Rules of Practice and Procedure (18 CFR 1.8 or 1.10) and the Regulations under the Natural Gas Act (18 CFR 157.10). All protests filed with the Commission will be considered by it in determining the appropriate action to be taken but will not serve to make the protestants parties to the proceeding.

Docket No. CP78-123, et al.

Any person wishing to become a party to a proceeding or to participate as a party in any hearing therein must file a petition to intervene in accordance with the Commission's Rules. All persons who have heretofore filed need not file again.

Kenneth F. Plumb
Secretary

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Alaskan Northwest Natural Gas)
Transportation Company)

Docket CP78-123. et al

APPLICATION OF ALASKAN NORTHWEST
NATURAL GAS TRANSPORTATION COMPANY
FOR AN ORDER APPROVING THE DESIGN SPECIFICATIONS
AND INITIAL SYSTEM CAPACITY OF THE ALASKAN SEGMENT
OF THE ALASKA HIGHWAY PIPELINE PROJECT

Alaskan Northwest Natural Gas Transportation Company (the Partnership)^{1/} pursuant to the Alaska Natural Gas Transportation Act of 1976 (ANGTA), the Natural Gas Act, the Decision and Report to Congress on the Alaska Natural Gas Transportation System as ratified by Congress (President's Decision) and the Commission's Order Vacating prior Proceeding and Issuing Conditional Certificate of Public Convenience and Necessity issued December 16, 1977, hereby applies for an order approving the design specifications and initial system capacity of the Alaskan segment of the Alaska Highway Pipeline Project.

In support thereof the Partnership would show as follows:

I

Background

The President's Decision issued by the President of the United States on September 27, 1977, and approved by Congress on November 22, 1977,^{2/} described the facilities necessary for the construction and initial operation of the system. This identification of facilities was required in Section 7(a)(4) of ANGTA. The President's Decision provided that:

-
- 1/ The Partnership is successor to Alcan Pipeline Company. Alcan filed its application with the Federal Power Commission on July 9, 1976, for a 42-inch pipeline in Alaska to be designed and operated at a maximum working pressure of 1260 psig. This proposal was amended on March 8, 1977, to provide additional expansibility by increasing the pipeline diameter to 48 inches at the same design pressure.
- 2/ Public Law 95-158, 91 Stat. 1268.

"... The facilities which are to be covered are those in the U.S. which are adequate for a throughput of up to 2.4 bcfd and are included in the revised Alcan filing submitted to the Federal Power Commission (FPC) in March 8, 1977. If any modifications to those facilities are required by the Agreement on Principles between the U.S. and Canada, those modified facilities will also be entitled to the expedited authorization process in Section 9." (p. 13)

"The gas transportation system will utilize a 48-inch diameter pipeline from Prudhoe Bay to James River, Alberta." (p. 13)

"Peak-day capacity utilizing nine compressor stations will be 2.6 bcfd, with an average daily volume of 2.4 bcfd. By installation of intermediate compressor stations, the system could be increased to 3.4 bcfd peak capacity, with an average day capacity of 3.2 bcfd. The system capacity could be further increased by addition to the compressor horsepower at each station." (p. 17)

The President's Decision, therefore, adopts the system as proposed by the Partnership subject only to the changes which might result from the implementation of the Agreement on Principles between U.S. and Canada. The Agreement between the United States and Canada on Principles applicable to the Northern Natural Gas Pipeline (Agreement on Principles) provided that a technical study group would be established by the governments for the purpose of testing and evaluating various combinations of pressure and diameter "which would achieve safety, reliability and economic efficiency for operation of the Pipeline" (Section 10). The Agreement on Principles also provided that the decision on pipeline specifications would remain the responsibility of appropriate regulatory authorities.

U.S. and Canadian government technical representatives met in order to carry out the obligations of the Agreement. The final results of these discussions are reflected in the Statement of Position Regarding Selection of Pipe for the Whitehorse, Yukon, to Caroline, Alberta, Segment of the Foothills Pipeline System issued by the National Energy Board of Canada (NEB) on February 17, 1978. The NEB provided that an increase in the design pressure to 1680 psig would require thorough testing.

estimated by the Canadian companies to delay the project up to two years. Therefore, the NEB did not change the design specifications for the pipeline segment from the Alaska/Yukon border to Whitehorse from the proposed 48-inch, 1260 psig system and selected a 56-inch, 1080 psig for the segment from Whitehorse, Yukon, to Caroline, Alberta, to accommodate reserves from the MacKenzie Delta region of Canada.

In order to resolve the design specifications for the Alaskan segment of the project the Director of the Alaska Gas Project Office of FERC (the Delegate) issued a report on September 27, 1978, and requested comments from the interested parties. Thereafter, the Delegate provided a period for reply comments and held an on-the-record conference among commenting parties on December 15, 1978. At the conclusion of the conference, the Delegate requested the Partnership to examine what would be involved in increasing the system pressure and whether such an increase is necessary or desirable. The Partnership has completed its review and also at the request of the Delegate, has met with several of the interested parties to present the conclusions of this review. The Partnership is now filing this Application for an order from the Commission to resolve the design specifications for the Alaskan segment of the project.

II

Summary of the Partnership's Position

The Partnership requests an order from the Commission approving the design specifications for the 48-inch pipeline with a maximum working pressure of 1260 psig and compressor station size and spacing for an initial capacity of 2.0 to 2.4 Bcfd expandable by the addition of intermediate compressor stations to an average daily volume of 3.2 Bcfd. This proposal is the same as was submitted to the Federal Power Commission in March, 1977.

The modification of facilities resulting from implementation of the Agreement on Principles did not affect the Alaskan segment of the project. The pipeline design in Canada commencing at the Alaska/Yukon border and continuing 260 miles to Whitehorse, Yukon, is a 48-inch pipeline with a maximum design pressure of 1260 psig, therefore, any increase in pressure of the Alaskan segment must consider the effect on the Canadian section of the project.

There are two reasons that the pressure for the Alaskan segment of the system might be increased. First is the expectation that the volumes of gas available from new reserves (other than

the presently proven reserves in the Prudhoe Bay Unit) within a reasonable period of time after deliveries commence is high enough that a higher pressure system might result in lower transportation costs over the life of the project. Second is the desirability of carrying larger quantities of hydrocarbon liquids in the gaseous phase by increasing the design pressure. The State of Alaska has made available to the Partnership a recent proposal by Earth Resources Company of Alaska to move the location of the conditioning plant from Prudhoe Bay to Fairbanks, Alaska. To avoid building any conditioning facility at Prudhoe Bay the pressure of the pipeline system from Prudhoe Bay to Fairbanks would be increased to 1680 psig which, it is claimed, would accommodate all hydrocarbon liquids. At Fairbanks the plant would not only condition the gas for further transportation by removing carbon dioxide and sufficient hydrocarbon liquids to meet the requirements of the design pressure of 1260 psig to be utilized thereafter in Alaska and in a portion of the Yukon, Canada, but also would remove from the stream most of the ethane and all heavier hydrocarbons. These hydrocarbons would either be utilized within the state, such as for petrochemical development, or delivered by a new pipeline system to tidewater (Cook Inlet) for delivery to U.S. or foreign markets. The State of Alaska has requested that the Partnership delay its filing originally planned for February 1, 1979, in order to address the feasibility of this proposal.^{3/}

The Partnership has concluded and will show herein that the proposed system is the best economic selection for delivery volumes up to 3.4 Bcfd and that there is no new evidence that this expansibility above the expected 2.0 Bcfd to be delivered from the presently proven reserves is inadequate.

As to liquid hydrocarbon carrying capacity the following conclusions are pertinent: (1) the pipeline design at 1260 psig can transport all of the ethane and propane that is available from the conditioning plant. The ethane would be the raw material for any in-state petrochemical development, therefore, the system design permits complete flexibility for ethane extraction in the future to meet the State of Alaska needs, (2) the increase in hydrocarbon liquids, primarily butane, that can be transported in the pipeline by increasing the pressure is about 5-11 thousand barrels per day and is a small volume in relation to the total oil and gas energy to be delivered which has alternative beneficial uses on the North Slope of Alaska, and (3) the increased volume of

^{3/} The State of Alaska has also requested that consideration be given to reducing the cost of the conditioning plant and increasing the hydrocarbon liquid carrying capacity by increasing the allowable carbon dioxide content of the gas. The increase in hydrocarbon liquid carrying capacity is in direct proportion to the increase in carbon dioxide content, subject to fuel balance changes in the plant. Even considering fuel mix changes the liquid increase is relatively minor. This matter is unrelated to the decision of selection of the design pressure and is therefore better left to contractual negotiations between the shippers, producers and State of Alaska which should be occurring in the near future.

liquids that could be transported must be extracted in Alaska since the design pressure as approved by appropriate regulatory authorities in the first Canadian section is 1260 psig.

The Partnership has analyzed the proposal by Earth Resources Company of Alaska and has concluded that the necessary result of this proposal will render the primary pipeline project infeasible and, therefore, it should not be given further consideration.

III

Alternatives Considered

In reviewing the design pressure decision the Partnership has considered the following alternatives to the proposed system:

1. A 48-inch pipeline design for a maximum working pressure of 1400 psig. This system would result from the increase in the pipeline safety code requirement of 72% of the calculated design pressure to 80%. This alternative would require a change in the pipeline safety code or a waiver by the Department of Transportation. A portion of the system which follows the Haul Road would require a double waiver that the Department of Transportation has indicated would not be granted.
2. A 48-inch pipeline with a maximum working pressure of 1440 psig
3. A 48-inch pipeline with a maximum working pressure of 1680 psig.

In considering these alternatives it is helpful to review the proposals of the three projects which were heard by this Commission and ultimately provided the basis for the selection by the President. The Arctic Gas proposal was for a 48-inch pipeline and a maximum working pressure of 1680 psig. The Arctic Gas System, however, contemplated volumes of 2.25 Bcfd from Alaska and 2.25 Bcfd from the MacKenzie Delta region of Canada. Although the MacKenzie Delta reserves did not materialize as expected, Arctic Gas proposed a minimum of 1.25 Bcfd initially increasing to 2.25 Bcfd in the fifth year of operation from the MacKenzie Delta. Therefore, the Arctic Gas project always contemplated total volumes of 3.5 to 4.5 Bcfd.^{4/} The El Paso

^{4/} Even though the Alaskan segment (195 miles) of the Arctic Gas project would carry only Alaskan gas the higher pressure system was selected in order to minimize the number of compressor stations in the Arctic National Wildlife Range.

project proposed a 42-inch pipeline with a maximum working pressure of 1680 psig for volumes of 2.4 to 3.2 Bcfd. The original Alcan proposal contemplated a 42-inch pipeline in Alaska with a maximum working pressure of 1260 psig for initial volumes of 2.4 Bcfd. In order to provide additional expansibility this system was amended to provide for a 48-inch pipeline at the same design pressure for the same initial volume.

These comparisons are significant to show that the present proposed system provides capacity equivalent to any of the competitive proposals which were considered by the Commission and the President. As the Partnership will show, it is not aware of any changes in circumstances or new additional gas reserve potential which would require reconsideration of the ultimate capacity to be provided by the pipeline system within Alaska.

IV

Optimum Design Pressure

In order to select the optimum economic design pressure it is necessary to determine the transportation cost of service at various volume levels and then to analyze the most likely initial volume with a final judgment as to the appropriate expansibility.

A common method for making economic comparisons between various pipeline systems is a graphical analysis as shown on Exhibits Z-4 and Z-5. This type of analysis permits inclusion of all of the variables which affect the cost of transporting natural gas into one common measure, that is, the cost of service per million Btu. These variables include system pressure, compressor station spacing, compressor station size and operation costs, including fuel. Exhibit Z-4 has been prepared based upon capital costs in 1975 dollars as filed with the Commission and adjusted for varying design specifications. A fuel cost of \$2.00 per million Btu has been assumed. This fuel cost in 1975 dollars may be high in light of the wellhead price established for the Prudhoe Bay field in the Natural Gas Policy Act of 1978 depending upon action by the Commission to establish regulations concerning the treatment of gathering, processing and compression charges prior to entering the pipeline system. The effect of a lower fuel cost is to increase the volume to be transported at the lowest cost of service for any design pressure. Even though the capital costs are based on 1975 dollars and hence not reflective of current costs, the relative difference in cost of service is still valid for comparison of each system.

Several conclusions are pertinent from this comparison. The minimum cost of service for a 48-inch, 1680 psig system is at a volume of 4.0 to 4.5 Bcfd which is compatible with the original Arctic Gas project proposal. The optimum volume or minimum cost of service for the 48-inch, 1260 psig system proposed by the Partnership is 3.0 to 3.5 Bcfd and is consistent with the Partnership's proposal for ultimately eighteen compressor stations in Alaska for an average daily volume of 3.2 Bcfd. The optimum volume or a minimum cost of service for a 48-inch, 1440 psig system is 3.5 to 4.0 Bcfd. Finally, the point at which the 48-inch, 1260 psig system is equivalent in cost of service to the 48-inch, 1440 psig system is approximately 3.4 Bcfd. Therefore, the 48-inch, 1260 psig system would deliver gas at a lower cost up to this volume.

Exhibit Z-5 has been prepared to show a comparison between a 42-inch, 1680 psig system (El Paso proposed a system of this size and pressure) and the 48-inch, 1260 psig system. This comparison shows that the transportation cost of service is approximately the same with either of these systems throughout the range of volumes transported.

The Partnership concludes that the proposed system without consideration of potential delays is the best economic selection for the Alaskan segment up to a volume of approximately 3.4 Bcfd.

The expected through-put volume is the prime consideration in assessing the expected transportation cost and thereby making the final judgment concerning the system design specifications. The State of Alaska, through its Department of Natural Resources, approved the proposed Producer Operating Plan for Prudhoe Bay in June, 1977. Under the Plan the delivery rate after processing would be 2.0 Bcfd. Providing a pipeline connection to Alaska will undoubtedly result in additional exploration and development and provide substantial additional gas reserves over the life of the project. The timing of these reserves additions is critical to the judgment concerning spare capacity that should be provided in the initial pipeline system.^{5/} The President's Decision concluded that:

^{5/} There is no limit to the capacity that can be provided if the pipeline is looped in the future with an additional, integrated pipeline. The issue here is the capacity that can be added with additional compression only.

"The certain increase in supply from an Alaska gas project is estimated to be 0.7 tcf per year (2.0 bcfd) by 1985. By 1990, a volume greater than 0.9 tcf (2.4 bcfd) might be produced." (p. 90)

Extensive analysis of the proven reserves and deliverability as well as the potential supply was done as part of the FPC proceedings prior to the President's selection. The result of this analysis was expressed by the FPC in its Recommendations to the President dated May 1, 1977, wherein it concluded:

"... Thus, we find the system should be designed to carry initially 2.0 to 2.5 Bcfd, and be capable of expansion to an additional 1.0-1.5 Ecfd..."
(p. I-17)

Utilizing the State approved volume of 2.0 Bcfd, such action taken after the FPC recommendation, the addition of 1.0-1.5 Bcfd of expansibility would result in a total capacity of 3.0-3.5 Bcfd. The proposed ultimate capacity of 3.2 Bcfd for the 48-inch, 1260 psig system is completely consistent with this recommendation.

Subsequent to the FPC recommendation a Report of the Working Group on Supply, Demand and Energy Policy Impacts of Alaska Gas was prepared by several Federal agencies and submitted to the President on July 1, 1977, as part of system selection process. This report estimated that expected additions by 1985 to proved gas reserves in the Prudhoe Bay structure would add deliverability of 0.3 Bcfd (p. 19). The same report contained general estimates of other potential North Slope reserves by three independent groups and concluded that the North Slope is judged to contain major potential reserves (p. 22). The report, however, cautioned that the estimates were not prepared to be used as a basis for pipeline design since exploratory drilling away from Prudhoe Bay is sparse or lacking. The State of Alaska also submitted potential reserve estimates indicating a range of deliverability including the Prudhoe Bay Unit from 2.0 to 4.2 Bcfd with a median of 2.8 Bcfd. These expectations are consistent with the FPC recommendation.

The Partnership is not aware of any developments which would change these prior views and hence urges the Commission to continue to adopt its prior recommendation that the ultimate capacity of the proposed system is adequate.

V

Hydrocarbon Liquids

The State of Alaska has urged consideration of a higher pressure system as a potential advantage to be able to transport a greater volume of hydrocarbon liquids for possible extraction and benefit to the State through development of a petrochemical industry in Alaska. The proposed system can transport all of the material which would be used as a petrochemical raw material that can be made available at Prudhoe Bay and, therefore, does not offer any impediment to the State's present or future plans. The recommended raw material for a petrochemical plant is ethane and the proposed pipeline system can transport all of the ethane or propane that could be available in the gas stream from Prudhoe Bay.

Further, the Partnership believes that the most economic way of selling liquid hydrocarbons, if not used within the State, is by leaving these hydrocarbons in the gas stream and thereby achieving the greatest value for the State.

A higher pressure system would be able to carry some greater volumes of heavier hydrocarbons, primarily butane.^{6/} However, these liquids are not useful in a petrochemical plant nor can they be transported in the Yukon, Canada, section of the line which is designed at 1260 psig. Therefore, it is best to retain these liquids on the North Slope for use as fuel, blending with the oil or reinjected into the reservoir.

The Partnership, as requested by the State of Alaska, has analyzed the impact of moving the conditioning plant from Prudhoe Bay to Fairbanks, Alaska. The Partnership has determined that if most of the ethane and all heavier hydrocarbons were removed at Fairbanks the total deliverable energy through the project would be reduced by 20% to 25%. This substantial reduction would render the project infeasible. First, the transportation costs would increase in about the same proportion, thereby jeopardizing the marketability of the remaining gas. Second, the volumes of gas would become small enough that potential purchasers would not be willing to undertake the substantial risks of this project for the supply to be made available.

^{6/} The increase is about five to eight thousand barrels per day at 1440 psig and eleven thousand barrels per day at 1680 psig which is less than 5% of the total liquid volumes in the raw gas.

The hydrocarbon liquids that would be extracted at Fairbanks, Alaska, as suggested by Earth Resources Company of Alaska would be about 168,000 barrels per day. In contrast, a world scale ethylene plant producing about one billion pounds of ethylene per year requires less than 30,000 barrels per day of ethane. Therefore, even assuming that petrochemical development is feasible there would be over 138,000 barrels per day (less plant fuel) of ethane and other hydrocarbons to transport to tidewater and market.^{7/} It simply does not make economic sense to extract a substantial portion of the stream to be sold as liquids by other means out of the State of Alaska. The most efficient way for the State to receive the highest value for its product that is not retained for use in the State is to keep it in the gas volumes to be sold through the Alaska Highway Pipeline Project.

The Partnership recommends that the selection of the 48-inch, 1260 psig system should not be revised due to hydrocarbon liquid considerations and that no further consideration should be given to moving the location of the conditioning plant to Fairbanks, Alaska.

VI

Financing Considerations

The selection of design pressure is not only contingent upon the ultimate capacity and transportation costs as analyzed in this application but also the resulting effect on project financability. The President's Decision requires that the Alaska Natural Gas Transportation System be privately financed. The Natural Gas Policy Act of 1978, recently passed by Congress, contains provisions which will assist in accomplishing the private financing of the project. Other matters remain to be resolved including: (1) issues of an incentive rate of return, as presently being addressed in the proceeding in Docket No. RM78-12; (2) approval of the cost of service tariff; and (3) the financial participation of each of the project beneficiaries including the project sponsors, the State of Alaska, major equipment suppliers and the producers. Resolution of these matters represents formidable financing tasks to be undertaken in the immediate future.

^{7/} Both Bonner & Moore (report dated January 23, 1978, prepared for the State of Alaska on the Utilization of Royalty Gas) and Earth Resources have stated that the feasibility of a petrochemical plant is only possible if all of the hydrocarbon liquids are extracted in order to reduce the unit cost of extraction even though only a small volume is needed for the petrochemical plant feedstock.

Recognizing this financing challenge, the Partnership believes that the imposition of a technological and cost-overflow risk, by increasing the pressure level of the system beyond the point which lenders believe is reasonable, will jeopardize an already difficult financing task. The reduction of volume if all hydrocarbon liquids are extracted would also jeopardize project financing. Imposition of these substantial additional risks is unnecessary since the potential benefits do not appear to outweigh the economic disadvantages, even without consideration of the added burden of financing difficulties. The position, from a financing viewpoint, has been described in the letter from Mr. Michael Stanfield, Vice President of Loeb, Rhoades, Hornblower & Company (Exhibit Z-6 attached hereto).

VII

Meetings With Interested Parties

The operating partner of the Partnership (Northwest Alaskan Pipeline Company) has met with certain of the parties interested in this decision. Meetings were held with representatives of the State of Alaska, Atlantic Richfield Company and the Department of Transportation. The information and conclusions described in this Application were reviewed with each party. No questions arose or new information which alters the Partnership's conclusions as to the appropriate design specifications.

VIII

The names, titles and mailing addresses of the persons to whom all correspondence and communications concerning this Application should be addressed are as follows:

Darrell B. MacKay
Vice President
Northwest Alaskan Pipeline Company
1801 K Street, N.W.
Suite 901
Washington, D.C. 20006

Jack D. Bachman, Esquire
General Counsel
Northwest Alaskan Pipeline Company
P. O. Box 1526
Salt Lake City, Utah 84110

Rush Moody, Jr., Esquire
Akin, Gump, Hauer & Feld
1155 15th Street, N.W.
Washington, D.C. 20005

WHEREFORE, the Partnership respectfully requests that the Commission issue an order accepting the design specifications for the system selected by the President for a 48-inch pipeline with the maximum working pressure of 1260 psig providing an initial system capacity of 2.0 to 2.4 Bcfd with expansibility by the addition of intermediate compressor stations up to 3.2 Bcfd for the Alaskan segment of the Alaska Highway Pipeline Project. The Partnership urges the Commission to approve the order requested herein as soon as possible in order to avoid delay and eliminate uncertainty so that the Partnership may proceed with the steps necessary to finance and construct the system. The Commission has already recognized the importance of such expeditious action in its comments on the President's Decision where it stated that:

"... Expeditious resolution of the pipe selection is of great importance to the Commission because final certification cannot proceed in its absence."
(p. 64)

Respectfully submitted,

Darrell B. MacKay
Darrell B. MacKay

ALASKAN NORTHWEST NATURAL GAS
TRANSPORTATION COMPANY, THE
PARTNERSHIP

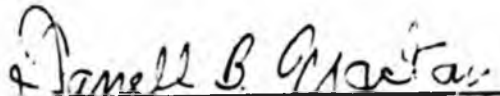
NORTHWEST ALASKAN PIPELINE COMPANY

VERIFICATION

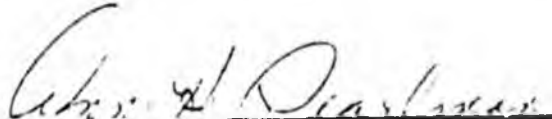
THE DISTRICT OF COLUMBIA §

I, DARRELL B. MacKAY, being first duly sworn on his oath, deposes and says:

That he is Vice President of Northwest Alaskan Pipeline Company and is duly authorized to make this affidavit, that he has read the foregoing and is familiar with the contents thereof, and that the facts and allegations contained therein are true and correct to the best of his information, knowledge and belief.


Darrell B. Mackay

Subscribed and sworn to before me this 2nd day of March, 1979.

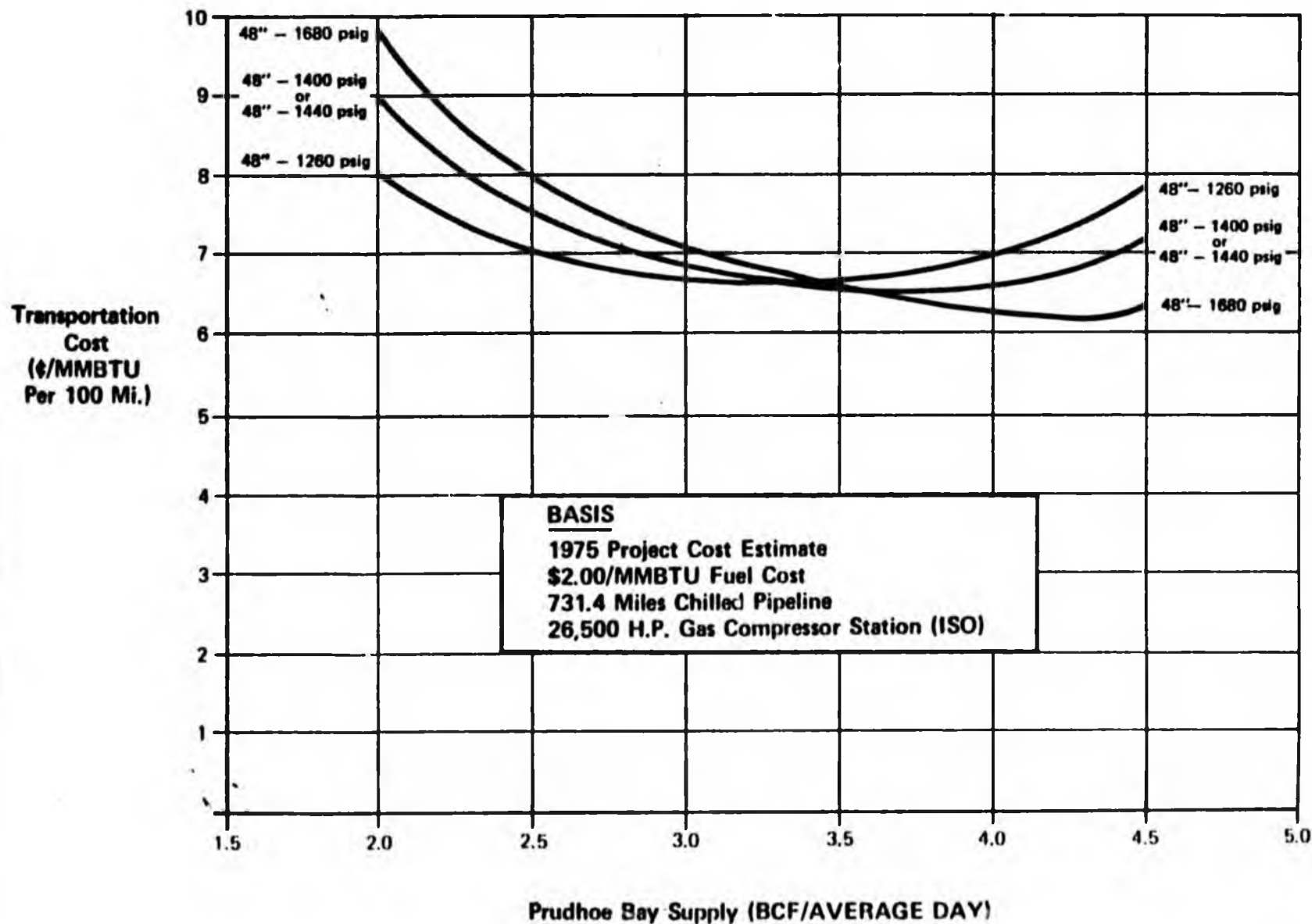

Notary Public

My Commission Expires:
MY COMMISSION EXPIRES JAN. 1, 1984

ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

EXHIBIT Z-4

TRANSPORTATION COST CURVES



ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

EXHIBIT Z-5

TRANSPORTATION COST CURVES

for 42" and 48" ALTERNATIVES

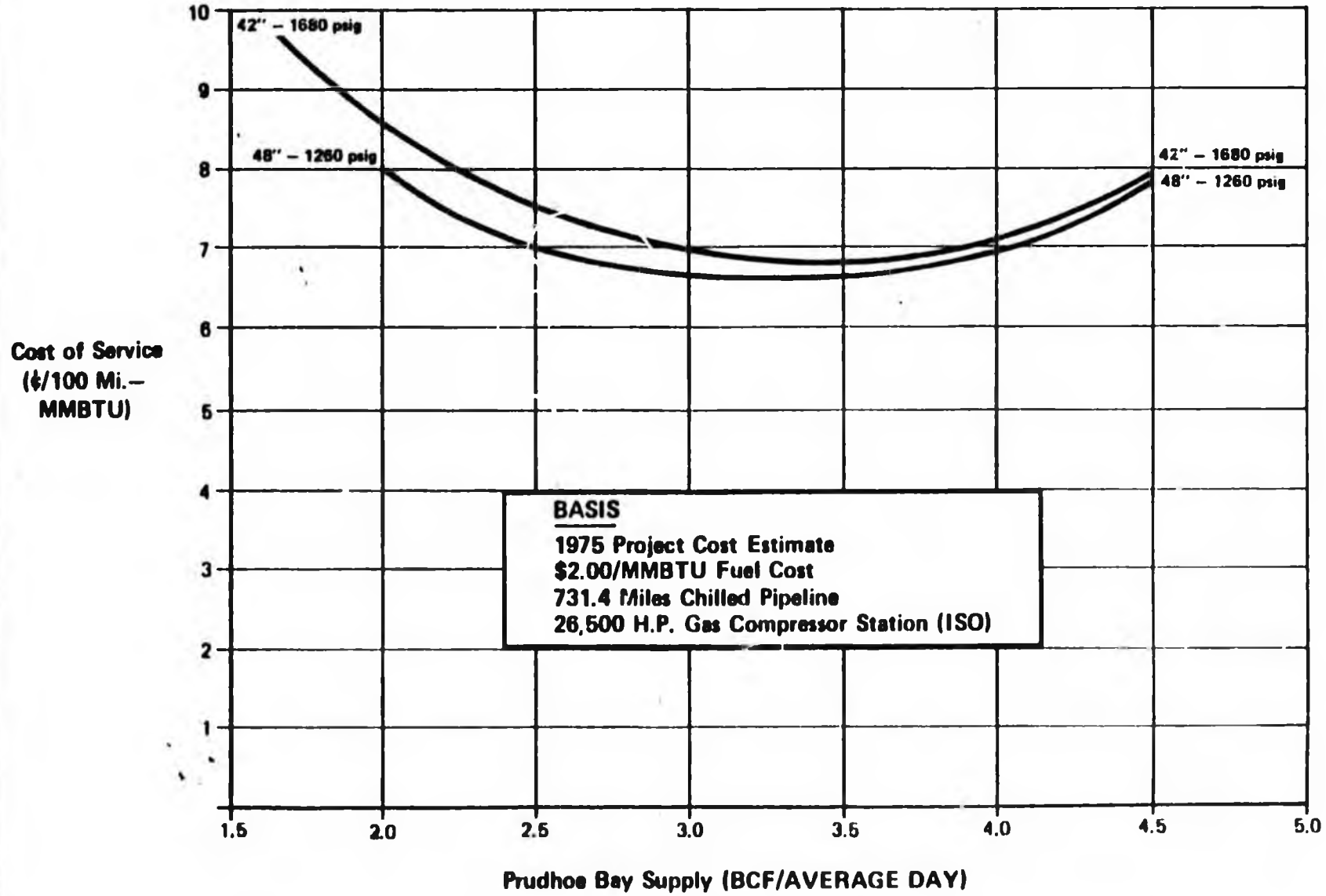


EXHIBIT Z-6

July 5, 1978

Mr. James W. Allen
Vice President - Finance
Northwest Alaskan Pipeline Company
Post Office Box 1526
Salt Lake City, Utah 84110

Dear Jim:

I would like to respond to your questions regarding the effect higher pressures might have on the financing of the Alaska Gas Project. As you know, throughout the proceedings we have felt that if sufficient conventionality is maintained, the Project could be financed on a project financing basis. This viewpoint has been premised on the Project obtaining the two basic fundamentals of project financing - technical feasibility and economic viability.

I understand that various parties are suggesting that Alaskan Northwest should consider redesigning to a higher pressure (such as 1680 psi). If the fundamental financing structure is changed so that ironclad guarantees from other parties are made available for the Project's debt, then such a redesign is possible. However, if the Project is to be project-financed in a manner consistent with the President's Decision and Report, a substantially different design scenario is highly unlikely to be accommodated by project financing. Let me explain why with references to the fundamentals discussed above.

"Technical feasibility", in lenders' minds, may be paraphrased as "proven technology". Lenders loan money at commercial borrowing rates not at entrepreneurial risk rates. Accordingly, they do not take technological risk. The following examples illustrate the technological step out associated with 1680 psi:

1. The commonly used operating pressures for gas transmission lines does not exceed about 1100 psi worldwide,
2. A major project recently built in Iran was planned at higher pressures, but was redesigned and built at 1100 psi. I understand that the lower design was used due to the fear of ductile fracture. Such risk is compounded in the Alaskan climate

July 5, 1978
Mr. James W. Allen

Page Two

3. Currently no large diameter transmission lines operate at 1680 psi.
4. Exxon and Shell are currently building a line in the North Sea which will operate initially at 2160 psi; however, this line is a blow-down line (decreasing pressures without compression) which operates above 0° C. and which was not project financed.

Additionally, the Canadian participants in the Alaska Gas Project have been profoundly opposed to higher pressures from the outset. The burden of trying to convince lenders to the Alaska segment to assume a technological risk that the equity participants in Canada will not accept is not practical. Lenders will not step substantially into untried technological territory in a project financing of this magnitude.

Let me now turn to the economics of the Project. Lenders and equity holders must view the Project on the basis of the currently proven reserves, not on the basis of projected reserves. Additionally, the cost of service effect of additional capacity availability without additional throughput will endanger the economics of the Project. Lenders will recognize that the current design plan is consistent with both the FERC (at that time, FPC) and U.S.G.S. recommendations.

This Project currently is burdened with all too many unknowns and variables. To add the risk associated with possible excess capacity to the Project will further complicate financing.

Further, one must consider the equity holders' position. The equity holders are currently subject to a reduction in the return on the equity component of the capitalization in the event of service interruption or throughput declines. If the perceived fear of interruption is higher under the higher pressure case, then the chances of equity holders taking the same degree of risk at 1680 psi as at 1260 psi is small. In other words, absent some sharing of risk by consumers and FERC, I question the enthusiasm equity partners will indicate towards investing in the higher pressure system.

In conclusion, I would like to make a general comment. Over the life of this Project, we have strived to imaginatively structure the financing to provide for private financing. However, lenders

July 5, 1978
Mr. James W. Allen

Page Three

will only take a limited amount of risk, and we cannot expect the lending community to break from traditional rules to finance this Project. I urge you to strongly indicate our concern that a substantial technological jump cannot be achieved in the Project if private financing, as currently planned, is to be achieved.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Michael R. Stanfield".

MICHAEL R. STANFIELD
Vice President
LOEB RHOADES, HORNBLOWER & CO.

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding in accordance with the requirements of § 1.17 of the Rules of Practice and Procedure.

Dated at Washington, D.C. this 2nd day of March, 1979.

Darrell B. MacKay
Darrell B. MacKay