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United States of America Before the Federal Energy Regulatory Commission

Docket No. CP80-

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Volume I

Application of ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

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For a Final Certificate of Public Convenience and Necessity Pursuant to Section 7 (C) of the Natural Gas Act, as amended, and Section 9 of the Alaska Natural Gas Transportation Act of 1976 to construct and operate the Alaska Segment of the Alaska Natural Gas Transportation System.

July 1, 1980

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ARLIS Alaska Resources Library & Information Services Library Building, Suite 111 3211 Providence Drive Anchorage, AK 99508-4614

UNITED STATES OF AMERICA

BEFORE THE

FEDERAL ENERGY REGULATORY COMMISSION

APPLICATION OF

ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

AT DOCKET NO. CP80-

FOR A FINAL CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY AUTHORIZING THE CONSTRUCTION AND OPERATION OF THE ALASKA SEGMENT OF THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM

UNITED STATES OF AMERICA BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

DOCKET NO. CP80-

APPLICATION OF ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY FOR A FINAL CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY AUTHORIZING THE CONSTRUCTION AND OPERATION OF THE ALASKA SEGMENT OF THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM

Alaskan Northwest Natural Gas Transportation Company ("Applicant" or "Alaskan Northwest") hereby submits its application for a final unconditional certificate of public convenience and necessity authorizing construction and operation of the Alaska segment of the Alaska Natural Gas Transportation System (ANGTS), pursuant to Section 7(c) of the Natural Gas Act, 15 U.S.C. §717f(c), Section 9 of the Alaska Natural Gas Transportation Act of 1976 (ANGTA), 15 U.S.C. §719g, and Part 157 of the Commission's Regulations. This application supplements that previously filed by Alcan Pipeline Company 1/ in Docket Nos. CP76-433 and RM77-6.

1/ Effective January 1, 1978, the name Alcan Pipeline Company was changed to Northwest Alaskan Pipeline Company.

Specifically, Alaskan Northwest proposes to construct and operate a 48-inch diameter natural gas pipeline, with a maximum operating pressure of 1260 psig, and related facilities, including seven compressor and two meter stations, extending approximately 743 miles from the Prudhoe Bay area of Alaska to a point of interconnection with the facilities of Foothills Pipe Lines (Yukon) Ltd. on the Alaska-Yukon border. Alaskan Northwest proposes to initially transport through these facilities up to an average daily volume of 2.0 Bcf of natural gas.

Alaskan Northwest is a partnership organized and existing under the laws of the State of New York. Participants in the partnership are all affiliates of major natural gas transmission companies. 2/ These companies represent a major segment of the natural gas industry in the United States and supply gas ultimately consumed in 39 states and the District of Columbia. In 1979, these companies, through their affiliates, sold in excess of 25 percent of all natural gas sold in the United States.

Northwest Alaskan Pipeline Company ("Northwest Alaskan") has been selected by the Alaskan Northwest partnership to be its operating partner. Northwest Alaskan is authorized to do business in the States of Alaska, Utah, Montana, California, Idaho and in the District of Columbia. Northwest Alaskan's principal place of business is 136 East South Temple, P.O. Box 1526, Salt Lake City, Utah 84110.

2/ Members of the partnership include Northwest Alaskan Pipeline Company - an affiliate of Northwest Pipeline Corporation and a subsidiary of Northwest Energy Company; American Natural Alaskan Company - an affiliate of Michigan-Wisconsin Pipe Line Company and a subsidiary of American Natural Resources, Inc.; Calaska Energy Company - an affiliate of Pacific Gas Transmission Company and a subsidiary of Pacific Gas and Electric Company; Northern Arctic Gas Company - an affiliate of Northern Natural Gas Company and a subsidiary of InterNorth, Inc.; Pacific Interstate Transmission Company (Arctic), an affiliate of Pacific Lighting Corporation; Pan Alaskan Gas Company - an affiliate of Pacific Lighting Corporation; Pan Alaskan Gas Company - an affiliate of Panhandle Eastern Pipe Line Company; and United Alaska Fuels Corporation - a subsidiary of United Gas Pipe Line Company. The names, titles, and mailing addresses of the persons to whom all correspondence and communications concerning this application should be addressed are as follows:

For Alaskan Northwest Natural Gas Transportation Company:

John G. McMillian Chairman of the Board of Partners Alaskan Northwest Natural Gas Transportation Company P. O. Box 1526 Salt Lake City, Utah 84110

Rush Moody, Jr.* Akin, Gump, Hauer & Feld 1333 New Hampshire Ave., N. W. Suite 400 Washington, D.C. 20036

David K. Watkiss* Watkiss & Campbell 310 N. Main Street, Suite 1200 Salt Lake City Utah 84110

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

Cuba Wadlington, Jr.* Director, Regulatory Affairs Northwest Alaskan Pipeline Company 1801 K Street, N.W., Suite 901 Washington, D.C. 20006

* Designated to receive service under Section 1.17(c) of the Commission's Regulations.

For Northwest Alaskan

I. APPROVALS REQUIRED FOR FINAL CERTIFICATION

On September 22, 1977 the President, pursuant to Section 7 of ANGTA, 15 U.S.C. §719e, issued his <u>Decision and Report on the</u> <u>Alaska Natural Gas Transportation System in which he selected</u> the Alcan proposal as the ANGTS. <u>3</u>/ This decision followed the discovery in 1968 of the largest accumulation of natural gas reserves in the United States at Prudhoe Bay, Alaska; the filing of competitive applications with the Federal Power Commission pursuant to Section 7 of the Natural Gas Act for authority to transport these reserves to the lower 48 states; the passage of ANGTA by Congress; two years of formal evidentiary hearings before the Federal Power Commission; the formal recommendation to the President by that Commission; comments to the President by all interested governmental agencies and departments on such recommendation; and, execution of the Agreement on Principles between the United States and Canada.

On December 16, 1977, the Federal Energy Regulatory Commission issued to the ANGTS Sponsors certificates of public convenience and necessity authorizing the construction and operation of the ANGTS, conditioned upon satisfaction of the relevant terms and conditions contained in the President's <u>Decision and Report</u> and resolution of related matters including variable rate of return provisions, system design and pipe selection, capital cost estimates, and tariffs.

In the subsequent two and one-half years since issuance by the Commission of conditional certificates, there have been many delays in the ANGTS, largely outside the control of the Applicant. During this time, however, the governments of both Canada and the United States have established a structure under which the ANGTS can now be successfully completed. Also, numerous regulatory approvals required for construction and operation of the ANGTS have now been obtained, including: approval of the Alaskan Northwest partnership agreement; approval of the Alaskan Northwest tariff; establishment of the incentive rate of return (IROR) mechanism; establishment of the Alaska segment design specifications; approval of pre-building of a portion of the southern Canada and lower 48 state portions of the ANGTS; and the establishment of technical and environmental stipulations for construction of the system. In addition, the Office of the Federal Inspector has been established pursuant to Reorganization Plan No. 1.

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<u>3</u>/ The President's <u>Decision</u> was ratified by a Joint Resolution of Congress on November 2, 1977. (H.R.J. Res. 621, Pub. Law No. 95-108, 91 Stat. 1268).

This application requests approval of the following three matters yet to be resolved, which require the submission of further information by the Applicant prior to issuance of a final unconditional certificate of public convenience and necessity: (1) approval of the remaining parameters necessary to implement the incentive rate of return mechanism - specifically, the Certification Cost Estimate (CCE) and the Center Point; (2) approval of Applicant's plan for the private financing of the Alaska segment of the ANGTS; and, (3) a determination that the Project costs are not unreasonably different from those considered as part of the President's <u>Decision and Report</u> and, therefore, that the Project continues to be in the national and public interest. $\underline{4}/$

By this Application Alaskan Northwest further requests (1) that the labor index or indices used to deflate actual project labor costs be those explicity defined in the terms and conditions of the Project Labor Agreement; and, (2) that the CCE be adjusted to reflect the actual third-party monitoring and other governmentrelated costs in establishing the Cost Performance Ratio.

Finally, Applicant requests the Commission to separately docket this Application and establish a new restricted service list. Applicant asks that a new restricted service list be compiled because of the burden and expense of serving the voluminous materials associated with this filing upon the hundreds of parties in Docket No. CP78-123 <u>et al</u>, who have not actively participated in these proceedings.

The Applicant is filing concurrently herewith an application 4/ for a Presidential Permit, pursuant to Executive Order 10485, authorizing the construction, connection, operation, and maintenance of facilities on the International Boundary between Canada In addition, the following matters will and the United States. require Commission action prior to construction of the Alaska segment: establishment of the carbon dioxide content of the gas to be transported; and final resolution of Commission Order No. 45, which found that the construction and operation of the Prudhoe Bay gas processing facilities remain the responsibility of the Alaska North Slope producers. Finally, the following matters related to the construction and operation of the Alaska segment will be the subject of future filings: approval of shipper tariffs; approval of downstream transportation and exchange agreements; any necessary approvals to export and import Alaskan gas; and certification of the remaining portions of the ANGTS Eastern and Western Legs not previously certificated in the prebuild proceedings.

Applicant recognizes that the Commission can take no action at this time concerning approval of a plan for the private financing of the Alaska segment and the comparison of the 1977 and 1980 capital cost estimates. The financing plan cannot be submitted at this time because Applicant recently entered into both a Cooperative Agreement and a Joint Statement of Intention with the principal North Slope producers - Exxon Corporation, Atlantic Richfield Company, and Sohio Alaska Petroleum Company. The Cooperative Agreement provides for a joint sharing of the costs of finalizing the engineering and design of both the ANGTS Alaska segment and the Prudhoe Bay gas processing facilities. The Joint Statement of Intention defines the process to develop a financing plan for the Alaska segment, including significant producer participation. Execution of these agreements will facilitate completion of the final financing arrangements necessary for construction and operation of the Alaska segment.

Additionally, as part of its financial exhibits, Alaskan Northwest will submit pro forma statements of operating revenues, expenses, and income for the first five years of operation at full capacity, the projected cost of service for the Alaska segment, and an analysis of the marketability of Alaskan gas during the life of Thus, the Commission determination that the ANGTS the project. continues to be in the national and public interest, and therefore should be finally certificated, cannot be made until the abovedescribed material has been submitted for review and approval. Accordingly, the Commission must defer its comparison of the 1977 and 1980 cost estimates pending review of such materials. Nonetheless, Applicant believes that the magnitude of the data in the instant filing, and the mandate of Section 9 of ANGTA requiring issuance of all ANGTS approvals as soon as practicable, requires submission of its CCE and Center Point request at this time. This will facilitate their timely consideration while Applicant simultaneously finalizes and submits its financing plan and related materials for later Commission review and approval.

II. THE CERTIFICATION COST ESTIMATE AND CENTER POINT REQUEST

The Certification Cost Estimate and risk analyses which support the Center Point requested are submitted herewith as Exhibits K and Z-7.

To aid in the understanding of the CCE and the Center Point request, and to ensure the expeditious approvals of both, Applicant is also submitting, as exhibits herewith, the location and description of the facilities to be constructed; flow diagrams; alignment sheets; design criteria; and an environmental engineering manual. 5/

The following are brief summaries of these latter exhibits, which are introductory to the more detailed description of the exhibits containing the CCE and the Center Point risk analyses.

A. Location and Description of Facilities To Be Constructed

1. Pipeline

The Alaska segment of the ANGTS will commence at the discharge side of the gas plant facilities in the Prudhoe Bay field. 6/The processing facilities will receive the gas from the production fields and treat and compress it to a delivery pressure of 1260 psig with a temperature of approximately 25° to 30° F. The gas to be transported will be provided to the pipeline from the gas plant with a gross heating value of 1100 Btu/SCF.

The pipeline itself will have a 48-inch outside diameter, and a pipe wall thickness which will vary from 0.600 to 0.864 inches, depending upon location. Internal pipe coating and a thin film external pipe coating will be applied to all sections of the pipeline as needed. With the exception of three aerial crossings, the pipe will be installed in the buried mode at depths of from 5 to 16 feet. The pipeline operating temperature of the gas will be between 0° F and +32° F under normal conditions.

The pipeline has been designed to minimize the effects of frost heave through insulation of the pipe, overexcavation, and/or rerouting to avoid soil problems. Such additional initial capital costs will reduce operation and maintenance costs over the Project life.

5/ On certain exhibits - G, G-1, K and Z-6 - there appears a statement that the information contained therein is deemed by Applicant to be confidential and/or proprietary. Applicant hereby waives confidentiality but preserves its proprietary rights to such information.

Additionally, while certain other materials may require review and/or approval by the Office of the Federal Inspector pursuant to the President's <u>Decision and Report</u>, they are submitted herewith for informational purposes and as background to the CCE and Center Point requests.

6/ These facilities will include unit processes for carbon dioxide and water removal; natural gas liquids extraction, separation, and selective blending; and sales gas compression and refrigeration. The plant design and construction, as well as the operation plans and engineering and economic estimates proposed in the R.M. Parsons studies, and submitted by Atlantic Richfield Company for Commission review in Docket No. RM79-19, are adopted by reference for purposes of this application. The pipeline will parallel the Trans Alaska Pipeline System (TAPS) in a southerly direction to Milepost 274 near Prospect Creek, Alaska. The pipeline will then follow TAPS in a southeasterly direction to Milepost 535 at Delta Junction. At this point the pipeline will diverge from the TAPS route, continuing in a southeasterly direction to the Alaska-Yukon border at approximately Milepost 743, where it will interconnect with the Canadian segment of the ANGTS. The specific pipeline route utilizes existing transportation corridors and maximizes use of existing facilities such as workpads, access roads, and material and disposal sites. The route avoids, to the greatest extent possible, TAPS and other pipeline crossings, highway crossings, frost-susceptible areas, and other sensitive areas, to minimize adverse impacts to the environment and on the socioeconomic structure adjacent to the route.

The pipeline will cross 24 major streams requiring special construction considerations, such as heavy-wall pipe, continuous concrete coating, or set-on concrete weights. At three major streams, aerial crossings will be utilized. Additionally, there will be 38 uncased road crossings, 35 road crossings with 56-inch casings, and ten road crossings with 66-inch casings. Furthermore, the pipeline will cross TAPS at 23 locations and the TAPS fuel gas line at ten locations.

Section 13(b) of ANGTA, 15 U.S.C. $\S719k(b)$, provides that the State of Alaska may transport its royalty gas in the ANGTS and withdraw such gas within Alaska. Both the Applicant and the Office of Pipeline Coordinator, State of Alaska, have made analyses of the existing, potential, and projected gas markets within the State and the alternate fuel availability in these markets. Based upon these studies the Applicant has concluded that six intermediate gas taps should initially be provided in the State of Alaska. 7/

Exhibits F, F-I, F-II, F-III, F-IV, and G describe in greater detail the location of facilities, the rights-of-way, flow diagrams, and flow rates. Exhibit Z-6 contains the alignment sheets. Exhibits Z-9.0 and Z-9.1 set forth in greater detail the pipeline and civil design.

2. Compressor and Meter Stations

To-provide the initial design flow rate capacity of 2.0 Bcfd, seven compressor stations will be required, each rated at 26,500

<u>7</u>/ While these market areas demonstrate the highest probability of future need for gas deliveries, the Applicant will consider adding additional points to the extent other points can be justified. When there is a specific proposal for gas service, Applicant will then file for the additional authorizations necessary to provide deliveries, including authorizations for any additional facilities required. horsepower. $\underline{8}/$ Two refrigeration units will be installed at each compressor station to maintain the pipeline gas temperature within the temperature range of 0° to 32° F. Gas heaters will be installed at Compressor Stations No. 2 and No. 4 to assure that gas temperatures will be maintained above the hydrocarbon dew point of the mixture under all operating conditions. Each compressor station will include buildings for the compressors, refrigeration equipment, utilities, flammable liquids storage, gas scrubber units, pumps, and living quarters.

Two metering stations will be provided, one to measure the quantity of gas supplied to the pipeline from the Prudhoe Bay gas processing facilities, and the other to measure the gas delivered to the Canadian segment at the Alaska-Yukon border.

Exhibit Z-9.2 sets out in greater detail the compressor and meter stations design.

3. Other Facilities

In addition to the pipeline and the compressor and meter stations, there will be a supervisory control system, a communications system, operation and maintenance facilities, and temporary facilities. The supervisory control system will operate the pipeline, perform related system balancing, and coordinate functions with the gas processing plant and the Canadian segment. The supervisory control system master station will be located in Fairbanks at the Operations Control Center. This center will include the dispatcher console, which will provide the monitoring and control equipment necessary for centralized operation of the Alaska segment of the Project. Backup control facilities will be provided at Compressor Station No. 11.

A communications system will be installed to support the supervisory control system, and will include voice and data transmission systems, a mobile radio system, and a records communications system. The data communications system will intertie with all other pipeline segments of the ANGTS, both in Canada and the United States.

Operation and maintenance facilities will be located at four sites along the pipeline and will include warehouses for storing project spare parts, as well as garages, maintenance shops, offices, and living quarters.

Temporary facilities will include those facilities required to support the construction phase activities, including seventeen pipeline construction camps with approximately 15,000 beds, seven

 $[\]underline{8}$ / With the future installation of nine additional stations the segment flow rate capacity could be expanded to 3.2 Bcfd in the future.

compressor station construction camps with approximately 1,800 beds, 12 airfields, access roads, approximately 300 material and disposal sites, and a pipe yard to receive mainline pipe for the coating, welding, and insulating of such pipe.

Exhibits Z-9.3, Z-9.4 and Z-9.5 describe in greater detail the supervisory control system, the communications system, operations and maintenance facilities, and the temporary facilities.

4. Environmental Safeguards

Applicant has carried out an extensive planning program on means to minimize the potentially adverse environmental consequences of construction, resulting in the development of an environmental engineering manual. This has been developed by examination of potential environmental problems that could be encountered during all phases of construction on all facilities to be constructed, including temporary facilities. Applicant will define the mitigative measures that must be taken by all contractors regarding protection of all species of fish, wildlife, and vegetation affected by construction.

Additionally, air and water quality plans, liquid and solid waste discharge plans, noise mitigation plans, hazardous substance plans, pesticides, herbicides and chemical plans, and petroleum hauling and spill plans will be developed. To insure that these plans are followed, specific environmental control standards will be incorporated into the contracts with all execution contractors.

The environmental engineering manual is in Exhibit Z-1.1.

B. Certification Cost Estimate

The Certification Cost Estimate for the Alaska segment was prepared in accordance with the President's <u>Decision and Report</u>, the directions of the Commission in Conditions Nos. 7 and 8 of Order No. 31, the Certification Cost Estimate format criteria developed by the Alaskan Delegate, 9/ and Section 157.14(a)(13) of the Commission's regulations, 18 C.F.R. §157.14(a)(13).

Under Finance Condition No. 2 of the President's <u>Decision and</u> <u>Report</u>, the CCE filing must allow a comparison of the 1980 estimate with the estimate filed by Alcan in March 1977. In order to allow this comparison, the Certification Cost Estimate filing format criteria developed by the Alaskan Delegate requires the recasting of the March 1977 estimate into the same format and the same base year dollars as the CCE. Alaskan Northwest's certification cost filing fully complies with these requirements.

^{9/} Alaskan Delegate's Report on Cost Estimate Formats noticed August 6, 1979 in Docket Nos. CP78-123 et al.

The CCE is submitted in January 1980 dollars. The estimate is a complete estimate for the purposes of obtaining a final certificate of public convenience and necessity from the Commission and of serving as the basis for the incentive rate of return determinations. Alaskan Northwest believes that this is the most accurate estimate that could be prepared for submittal with this application. However, as contemplated by the President's Decision and Report, this estimate will not be the final cost estimate. The engineering, design, and alignment of the Alaska pipeline were "frozen" as of April 30, 1980 in order to prepare this certification cost filing in accordance with a procedural timetable which will allow the issuance of a final certificate to Alaskan Northwest by early 1981. Further design and engineering will take place between April 30, 1980 and the time that Alaskan Northwest presents its final design cost estimate and construction schedule to the Federal Inspector (i.e., prior to the commencement of construction), in accordance with Condition No. I-5 of the President's Decision and Report. Any changes in the cost estimate resulting from design changes after April 30, 1980 will be submitted to the Federal Inspector pursuant to the President's Decision and Report and Condition No. 9 of Order No. 31.

The cost estimates submitted herewith reflect costs associated with numerous changes in the design of the facilities that have taken place since the President's <u>Decision and Report</u>, resulting from increased government requirements, the delays in scheduling that have occurred since such <u>Decision</u>, which have been largely outside the control of Applicant, the organizational changes that have been made as a result of that <u>Decision</u> and Reorganization Plan No. 1, and other factors enumerated in Exhibit K.

The Certification Cost Estimate submitted herewith was prepared and premised on the following assumptions: (1) all governmental approvals are obtained in the time frame included in the major milestone schedule; (2) the final design is acceptable for Notice to Proceed applications and construction bid inquiries; (3) market conditions at the time of placement of major purchase orders are generally the same as assumed in the CCE; (4) an adequate supply of a competent and trained work force will be available; (5) competitive fixed unit-rate bids can be obtained; (6) an adequate supply of contractor-owned construction equipment will be available to minimize the effects of competition between contractors in obtaining such equipment; (7) a Project Labor Agreement 10/ can be executed which contains the same terms and conditions regarding work rules, justification, and rates of

10/ The Project Labor Agreement is expected to apply to all of the various labor unions whose members work on the Project.

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pay currently in effect in Alaska, with escalation to be held within the current Presidential wage guidelines; and (8) a construction work schedule of 10 hours per day, 7 days per week will be in effect.

The CCE for the total Alaska segment is \$7.9 billion. This includes \$4.1 billion for pipeline and civil work, \$887 million for temporary facilities and services, \$693 million for compressor and metering stations, \$97 million for communications and supervisory systems, \$53 million for operation and maintenance facilities, \$1.2 billion for project directorate, including Project Management Contractor (PMC) costs, and \$846 million for the normal contingency allowance. <u>11</u>/ These costs are in January 1980 dollars and exclude any finance charge or an allowance for funds used during construction.

C. <u>Center Point Justification</u>

In Order Nos. 31 and 31-B the Commission provided that the ANGTS Sponsors could use either a formula approach for establishing the appropriate Center Point, or could request a Center Point without reference to the formula "...if a major change had occurred in the project which would result in a total estimated cost for the project, including likely overruns, that exceeded the estimates in the [President's] <u>Decision</u>." Order No. 31-B at 4. In Order No. 31-B the Commission further provided that "[t]he exhibit dealing with the Center Point should assess the likelihood of abnormal events that could increase costs which are not covered under the Change in Scope mechanism and the impact on costs that these events would have. This information will be used to set a Center Point that compensates for the possibility of abnormal events increasing costs." Order No. 31-B at 8.

Because of both the design changes and schedule delays that have taken place since issuance of the President's <u>Decision</u>, the Applicant has chosen to request a Center Point without reference to the CCE. The Center Point requested, 1.292, is based upon risk analyses of abnormal or unlikely events that could affect Project costs, and events examined in such analyses specifically do not include those contemplated by either the change in scope or design change mechanisms.

11/ This normal contingency allowance represents the expected value of the distribution of Project costs resulting from in-scope estimating uncertainties associated with the base cost estimates. In-scope estimating uncertainty is defined as the variation in Project costs and schedules resulting from: accuracy of material quantities estimates; human productivity assumptions; equipment reliability assumptions; engineering/design development; accuracy of scheduled durations; and accuracy of bid specifications based on current Project definitions.

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To develop the cost impact of abnormal events, Applicant first defined over 100 possible events, each of which was assigned to one of the three Order No. 31-B categories: abnormal events, design changes, and scope changes. Applicant then defined the occurrence probability for each event classified as abnormal, the range of cost impact, and the schedule impact.

Three values were established for each cost: the most likely value; the value representing a 10 percent probability that costs will be less than the value; and the value representing a 10 percent probability that costs will be greater than the value. A similar range of schedule delays was developed for those events that could affect Project schedule. From these analyses a range of cost impacts was determined which formed the basis for the selection of the Center Point requested.

Applicant also has prepared a list of those events which will qualify as either a design change or change in scope and which were specifically excluded from the abnormal events examined in the Center Point risk analyses. 12/

III. OTHER IROR MATTERS

In addition to the uncertainties associated with the CCE and the Center Point, Applicant has identified two other issues that affect the IROR procedure: the appropriate labor cost indices used to deflate actual Project labor costs; and the treatment of third-party monitoring and other government-related costs.

A. Labor Indices

In Order No. 31 the Commission stated that the actual capital cost (the sum of direct construction costs actually incurred in constructing the pipeline) should be adjusted to eliminate the effects of general inflation prior to calculating the Cost Performance Ratio and the IROR. <u>13</u>/ For this purpose, the Commission provided an inflation adjustment mechanism to deflate direct construction costs (excluding interest during construction) to base-year prices for comparison with the CCE.

12/ This list is found at Exhibit Z-7, Section 5.0.

13/ Order No. 31 at 111.

Applicant, in accordance with the Commission's invitation in Order No. 31-B, <u>14</u>/ proposes that the proper labor cost index component to the composite index for the inflation adjustment mechanism should be that index or indices which are explicitly defined in the terms and conditions of the Project Labor Agreement. The adoption of a labor index or set of indices by Applicant prior to negotiating actual wage rates and escalation clauses in the terms and conditions of the Project Labor Agreement will severely limit Applicant's ability to reduce costs. Such predetermined indices will establish an artificial floor for wage rate discussions and thus constrain its negotiating position. This will undoubtedly result in higher Project labor costs than if the labor indices were not predetermined.

B. Third Party Monitoring Costs

Under the terms of the Mineral Leasing Act and certain other federal and state statutes, Applicant is obligated to reimburse federal and state agencies for certain categories of expenditures involving the Project. In preparing the CCE, Applicant requested and received an estimate of reimbursable costs that would be incurred by various federal and state agencies. Applicant has not made an independent evaluation of the validity of these estimates. For submission purposes, these costs have been included in the CCE. However, Applicant proposes that the CCE be adjusted to equal the actual capital costs for third-party monitoring and other government-related costs for the determination of the Cost Performance Ratio. Applicant should not be required to accept a Cost Performance Ratio based in part on cost estimates or the subsequent actual costs that were not prepared under its supervision or control. 15/

14/ In Order No. 31-B the Commission stated as follows:

In order to allow the sponsors to more fully develop detailed proposals for the labor cost portion of the composite index within the general framework established in Order No. 31, and for the Commission to review these proposals, the Commission will reserve a final decision on the exact specifications of the labor component of the composite index until the sponsors have filed their Certification Cost and Schedule Estimates. With the filing of the Certification Estimates, the Commission expects the sponsors to specify in detail the quarterly or annual cost categories for labor and the measure of labor wage rates for each cost category that they propose. After reviewing the specific proposals submitted by the sponsors concerning labor cost indices, the Commission will approve or modify these proposals in conjunction with its consideration of the Certification Estimates.

Order No. 31-B at 30.

15/ Examples of the costs included are a \$50,000,000 Community Impact Contingency Fund, training expenses to upgrade the skills of local welders, and \$22,000,000 to construct a jail and expand a hospital wing.

CONCLUSION

Wherefore, for all the foregoing reasons, Applicant, Alaskan Northwest Natural Gas Transportation Company, a partnership constituted as shown herein, respectfully requests the Commission to: (1) expeditiously review and approve the Certification Cost Estimate, as submitted herein, and a Center Point of 1.292; (2) permit the use of the index or indices in the Project Labor Agreement for deflation of direct construction labor costs; (3) provide for adjustment of the CCE to reflect actual third-party monitoring and other government-related costs in computing the Cost Performance Ratio; (4) defer its comparison of the 1977 and 1980 cost estimates pending submission of Applicant's financing plan and related materials; and, (5) issue to Applicant a final unconditonal certificate of public convenience and necessity after review and approval of Applicant's financing plan.

Respectfully submitted,

Alaskan Northwest Natural Gas Transportation Company

/s/ John G. McMillian

JOHN G. McMILLIAN Chairman of the Board of Partners

Dated at Washington D.C. This 30th day of June, 1980

AFFIDAVIT

District of Columbia

) SS:

JOHN G. McMILLIAN, being first duly sworn, on oath, deposes and says:

That he is Chairman of the Board of Partners of Alaskan Northwest Natural Gas Transportation Company; that he is familiar with the contents of the foregoing Application for a Final Certificate of Public Convenience and Necessity Authorizing the Construction and Operation of the Alaska segment of the Alaska Natural Gas Transportation System; that as such Chairman of the Board of Partners, he has executed the same for and on behalf of said Partnership with full power and authority to do so; and that the facts set forth therein are true and correct to the best of his knowledge, information and belief.

/s/ John G. McMillian

JOHN G. McMILLIAN Chairman of the Board of Partners

SUBSCRIBED AND SWORN TO before me, the undersigned,

this 30th day of June, 1980.

/s/ Patricia A. Walker

NOTARY PUBLIC Residing at Washington, D.C.

My Commission Expires:

January 1, 1985

UNITED STATES OF AMERICA BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

ALASKAN NORTHWEST NATURAL GAS) TRANSPORTATION COMPANY) DOCKET NO. CP80-

NOTICE

Take notice that on June 30, 1980 Alaskan Northwest Natural Gas Transportation Company (Alaskan Northwest) a New York partnership whose mailing address is P.O. Box 1526, Salt Lake City, Utah 84110, filed an application for a final certificate of public convenience and necessity authorizing construction and operation of the Alaska segment of the Alaska Natural Gas Transportation System (ANGTS).

Alaskan Northwest is a partnership whose members are affiliates of major natural gas transmission companies and is the successor-in-interest to Alcan Pipeline Company (Alcan), which was granted a conditional certificate of public convenience and necessity to construct and operate the Alaska segment of the ANGTS by the Commission on December 16,1977, in accordance with the President's <u>Decision and Report on an Alaska Natural Gas</u> Transportation System.

By this application Alaskan Northwest requests final Commission authority to construct and operate 743 miles of pipeline, seven compressor stations, and related facilities for the transportation of up to 2.0 billion cubic feet per day of Alaska gas. The facilities for which final approval are sought can be expanded to a capacity of 3.2 bcfd with the addition of nine compressor stations.

By the instant application Alaskan Northwest requests: (1) approval of the remaining parameters necessary to implement the incentive rate of return mechanism, specifically the Certification Cost Estimate and the Center Point; (2) approval of a private financing plan for the Alaska segment of the ANGTS; and, (3) a determination that the Project costs are not unreasonably different than those considered in the President's Decision and Report.

Alaskan Northwest requests that the Commission expeditiously review the instant application and (1) approve both the Certification Cost Estimate and the proposed Center Point; (2) establish the proper labor indices to deflate actual project labor costs; (3) adjust the Certification Cost Estimate to appropriately account for third-party monitoring and all other governmentrelated costs; and (4) establish a restricted service list. Any person desiring to be heard should file a petition to intervene with the Federal Energy Regulatory Commission, 825 North Capital Street N.E., Washington, D.C. 20425, in accordance with the applicable provisions of the Commission's Rules of Practice and Procedure. All such petitions should be filed on or before _______. Copies of the filing are on file with the Commission and are available for public inspection.

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Pursuant to the President's <u>Decision</u>, Order Nos. 31 and 31-B, and Section 157.14 of the Commission's regulations, the following exhibits are filed, or will be filed at a later date, are incorporated by reference, or are omitted, as appropriate:

VOLUME	EXHIBIT	TITLE
I	EXHIBIT A	Articles of Incorporation
		Submitted herewith.
I	EXHIBIT B	State Authorizations
		Submitted herewith.
I	EXHIBIT C	Company Officials
		Submitted herewith.
I	EXHIBIT D	Subsidiaries and Affiliates
		Submitted herewith.
I	EXHIBIT E	Other Pending Applications and Filings
		Submitted herewith.
I	EXHIBIT F	Location of Facilities
		Submitted herewith.
I	EXHIBIT F-I	Factors Considered in Use of Joint Rights-of-Way
		Submitted herewith.
I	EXHIBIT F-II	Factors Considered in Locating Facilities in Scenic Historic or Wildlife Areas

Submitted herewith.

OVERALL TABLE OF CONTENTS (Continued)

VOLUME EXHIBIT TITLE

I EXHIBIT F-III <u>Statement of Adoption of Guidelines</u> <u>Concerning Rights-of-Way and Con</u>struction Activities

> Submitted herewith. See also Commission Order of February 26, 1980 in Docket Nos. CP78-123, <u>et al</u>.

I EXHIBIT F-IV Statements by the Applicant Concerning the Requirements of the National Environmental Policy Act of 1969, Public Law 91-190, 83 Stat. 852, Title I, Section 102

> The information required by Exhibit F-IV has heretofore been presented in the proceedings leading to the President's <u>Decision and Report</u> and remains unchanged. Those materials were found to be in compliance with NEPA by both the President's <u>Deci-</u> <u>sion and Report</u> and a Joint Resolution of Congress (Public Law 95-158). Accordingly, no additional regulatory action is required pursuant to NEPA.

I EXHIBITS G, Flow Diagram Data

Submitted herewith.

I EXHIBIT H Total Gas Supply Data

Submitted herewith.

I EXHIBIT I <u>Market Data</u>

G-I and G-II

To be submitted at a later date.

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	I	EXHIBIT J	Conversion to Natural Gas
			To be filed by the shippers of Alaska Gas.
	II	EXHIBIT K	Cost of Facilities
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	I	EXHIBIT L	Financing
			To be submitted at a later date.
	I	EXHIBIT M	Construction, Operating and Management
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	I	EXHIBIT N	Revenues-Expenses-Income
			To be submitted at a later date.
	I	EXHIBIT O	Depreciation and Depletion
			Submitted herewith.
	I	EXHIBIT P	Tariff
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	IľI	EXHIBIT Z-1.1	Environmental Engineering Manual
			Submitted herewith.
	IV	EXHIBIT Z-2	Description of Gas Processing Facilities
			Submitted herewith.
	IV	EXHIBIT Z-3	Description of and Location of Canadian Facilities
			To be submitted at a later date.

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IV	EXHIBIT Z-4	Description and Location of Lower 48 Facilities
		To be submitted at a later date.
IV	EXHIBIT Z-5	Reliability and Compatibility of Related Facilities
		To be submitted with the financing plan at a later date.
	EXHIBIT Z-6	Alignment Sheets
		Submitted herewith.
V	EXHIBIT Z-7	Center Point Justification
		Submitted herewith.
	EXHIBIT Z-8	ANGTS Total Investment and Cost-of-Service
,		To be submitted with the Financing Plan at a later date.
VI,	EXHIBITS Z-9	Design Manual
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Docket No. CP80-Exhibit A Hearing Exhibit No.

EXHIBIT A

ARTICLES OF INCORPORATION AND BYLAWS

Alaskan Northwest Natural Gas Transportation Company ("Applicant") is a general partnership formed pursuant to the Uniform Partnership Act of the State of New York.

On April 17, 1978, Applicant filed at Docket CP78-123 an Application and Notice of Succession in Interest and Transfer of Certificate of Public Convenience and Necessity. The application was being filed pursuant to the provisions of the Alaska Natural Gas Transportation Act of 1976 ("ANGTA"), 15 U.S.C. Section 719 <u>et</u>. <u>seq</u>., the Natural Gas Act, 15 U.S.C. Section 717 and the Rules and Regulations of the Federal Energy Regulatory Commission ("FERC").

Attached to the above-described application as a part thereof, for all purposes, was the Partnership Agreement entered into March 3, 1978, effective as of January 31, 1978, by the Companies listed in Exhibit D, excluding American Natural Alaskan Company.

On May 26, 1978 Applicant filed an amendment to the Partnership Agreement to establish discount provisions for early participation in the partnership.

On June 30, 1978 the FERC issued an order transferring the conditional certificate to Applicant and approving the Partnership Agreement as amended.

On February 6, 1980 Applicant filed a second amendment to the Partnership Agreement for the admission of American Natural Alaskan Company and a waiver of the discount provisions for early participation in the partnership for a 30-day period. As of the filing date of the instant application, there had been no action on the second amendment to the Partnership Agreement by the FERC.

WHEREFORE, in lieu of FERC's regulation at Section 157.14(a)(1), 18 C.F.R., Applicant incorporates by reference the partnership agreement as amended and previously filed with FERC.

Docket No. CP80-Exhibit B Hearing Exhibit No.

EXHIBIT B

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STATE AUTHORIZATION

Alaskan Northwest Natural Gas Transportation Company ("Applicant") is a general partnership and as such is not required to register with state regulatory authorities.

Docket No. CP80-Exhibit C Hearing Exhibit No.

EXHIBIT C

COMPANY OFFICIALS

1.0 BOARD OF PARTNERS

Name/Title/Company

John G. McMillian Chairman of the Board of Partners Chairman of the Board, President and Chief Executive Officer Northwest Alaskan Pipeline Company

Kenneth E. Kalen President Pan Alaska Gas Company

Harry L. Lepape President Pacific Interstate Transmission Company (Arctic)

Gordon L. Severa President Northern Arctic Gas Company

D. Lamar Smith President United Alaska Fuels Corporation

James J. Trebilcott Executive Vice President American Natural Alaskan Company

John A. Sproul Chairman of the Board Calaska Energy Company

Business Address

P.O. Box 1526 Salt Lake City, Utah 84110

P.O. Box 1348 Kansas City, Missouri 64141

720 West Eighth Street Los Angeles, California 90017

2223 Dodge Street Omaha, Nebraska 68102

P.O. Box 1478 Houston, Texas 77001

One Woodward Avenue Detroit, Michigan 48226

77 Beale Street San Francisco, California 94106

Docket No. CP80-Exhibit C Hearing Exhibit No.

2.0 OFFICERS OF OPERATING COMPANY

Name/Title Business Address John G. McMillian P.O. Box 1526 Chairman of the Board, Salt Lake City, Utah President and Chief Executive Officer 84110 P.O. Box 1526 Thomas W. diZerega Vice Chairman of the Board Salt Lake City, Utah 84110 J. D. Bachman P.O. Box 60089 Vice President - Alaskan Operations Fairbanks, Alaska 99706 Howard E. Butner 1801 K Street, NW Vice President - Finance Suite 901 Washington, D.C. 20006 Robert N. Hauser 3333 Michelson Vice President - Construction Irvine, California 92730 and Logistics 3333 Michelson Lucius D. Legg Vice President - Operations Irvine, California 92730 Darrell B. MacKay Vice President - Regulatory 1801 K Street, NW Suite 901 and Governmental Affairs Washington, D.C. 20006 Peter W. Stevens P.O. Box 1526 Vice President - Administration Salt Lake City, Utah 84110 Joseph N. Vallely P.O. Box 1526 Vice President - Public Relations Salt Lake City, Utah 84110 John M. Viehweg P.O. Box 1526 Vice President - Engineering Salt Lake City, Utah 84110

Docket No. CP80-Exhibit C Hearing Exhibit No. 2.0 OFFICERS OF OPERATING COMPANY (Continued) P.O. Box 1526 General Counsel and Secretary Salt Lake City, Utah 84110 P.O. Box 1526 Salt Lake City, Utah 84110 P.O. Box 1526 Assistant Controller Salt Lake City, Utah 84110 P.O. Box 1526 H. Chad Backstead, Jr. Assistant Treasurer Salt Lake City, Utah 84110 P.O. Box 1526 Salt Lake City, Utah Assistant Secretary 84110 P.O. Box 1526 Salt Lake City, Utah Assistant Secretary 84110 1801 K Street, NW Assistant Secretary Suite 901 Washington, D.C. 20006 P.O. Box 1526 Salt Lake City, Utah 84110

John W. Hammett

Vinton L. Wolfe

Jacob G. Banyai

David M. Higbee

James B. Mason

Donna Mikucki

Controller

Barbara Moreno Assistant Secretary

Docket No. CP80-Exhibit D Hearing Exhibit No.

EXHIBIT D

SUBSIDIARIES AND AFFILIATION

Alaskan Northwest Natural Gas Transportation Company ("Applicant") is a general partnership formed pursuant to the Uniform Partnership Act of the State of New York.

As of May 1, 1980, the following parties are general partners to the ANNGTC Partnership:

1.1 Northern Arctic Gas Company, a corporation organized under the laws of the State of Delaware, with its principal corporate offices at 2223 Dodge Street, Omaha, Nebraska. Northern Arctic Gas Company represents that: (a) all of its capital stock is owned by InterNorth Incorporated, a Delaware corporation; and (b) InterNorth Incorporated also owns all of the common stock of the Northern Natural Gas Company, a Delaware company which intends to become a Shipper.

1.2 Northwest Alaskan Pipeline Company, (operator), a corporation organized under the laws of the State of Delaware, with its principal corporate offices at 315 East 200 South Street, Salt Lake City, Utah. Northwest Alaskan Pipeline Company represents that: (a) all of its stock is owned by Northwest Energy Company, a Utah corporation; and (b) Northwest Energy Company also owns all of the common stock of Northwest Pipeline Corporation, a Delaware corporation, which intends to become a Shipper.

1.3 Pan Alaskan Gas Company, a corporation organized under the laws of the State of Delaware, with its principal corporate offices at 3000 Bissonnet Avenue, Houston, Texas. Pan Alaskan Gas Company represents that: (a) all of its capital stock is owned by Panhandle Eastern Pipe Line Company, a Delaware corporation; and (b) Panhandle Eastern Pipe Line Company intends to become a Shipper.

1.4 Calaska Energy Company, a corporation organized under the laws of the State of California, with its principal corporate offices at 77 Beale Street, San Francisco, California. Calaska Energy Company represents that: (a) all of its capital stock is owned by Pacific Gas and Electric Company, a California corporation, which also owns all of the common stock at Pacific Gas Transmission Company, a California corporation; and (b) Calaska Energy Company intends to become a Shipper.

Docket No. CP80-Exhibit D Hearing Exhibit No.

1.5 Pacific Interstate Transmission Company (Arctic), a corporation organized under the laws of the State of California, with its principal corporate offices at 720 West Eighth Street, Los Angeles, California. Pacific Interstate Transmission Company (Arctic) represents that: (a) all of its capital stock is owned by Pacific Interstate Transmission Company, a California corporation, whose capital stock is owned by Pacific Lighting Corporation, a California corporation; and (b) Pacific Interstate Transmission Company (Arctic) intends to become a Shipper.

1.6 United Alaska Fuels Corporation, a corporation organized under the laws of the State of Delaware, with its principal office at 700 Milam Street, Houston, Texas. United Alaska Fuels Corporation represents that: (a) all of its capital stock is owned by United Gas Pipe Line Company, a Delaware corporation; and (b) United Energy Resources Incorporated, a Delaware Corporation owns all of the common stock of United Gas Pipe Line Company, which intends to become a Shipper.

1.7 American Natural Alaskan Company, a company organized under the laws of the State of Michigan with its principal office at One Woodard Avenue, Detroit, Michigan. American Natural Alaskan Company represents that: (a) all of its capital stock is owned by American Natural Resources Company, a Michigan corporation; and (b) American Natural Resources Company also owns all of the common stock of Michigan Wisconsin Pipe Line, a Delaware corporation, which intends to become a Shipper.

Docket No. CP80-Exhibit E Hearing Exhibit No.

EXHIBIT E

OTHER PENDING APPLICATIONS AND FILINGS

Alaskan Northwest Natural Gas Transportation Company ("Applicant") has the following filings pending before the FERC at the time of the filing of the instant application.

- a. Application of Alaskan Northwest Natural Transportation Company for an Order Approving Past Expenditures and to Establish Procedures for Continuing Audit and Approval of Future Expenditures and Major Commitments at Docket No. CP78-123 et al., filed February 2, 1979.
- b. Application of Alaskan Northwest Natural Gas Transportation Company for an Order Approving Cost Estimate Format at Docket No. CP78-123 et al., filed August 8, 1979.
- c. Supplemental Application of Alaskan Northwest Natural Gas Transportation Company for an Order Approving Past Expenditures and to Establish Procedures for Continuing Audit and Approval of Future Expenditures and Major Commitments at Docket No. CP78-123 <u>et al</u>., filed August 14, 1979.
- d. Notice of Amendment to Partnership Agreement, Alaskan Northwest Natural Gas Transportation Company at Docket No. CP78-123 et al., filed February 6, 1980.

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Docket No. CP80-Exhibit F Hearing Exhibit No.

2.0 ALASKA SEGMENT FACILITIES

Figure F-2-1 displays a map of the Alaska Segment of the ANGTS, indicating the proposed general pipeline route, and highlighting the major planned facilities. Additional details are contained in the exhibits noted below concerning the facilities to be constructed or acquired, and the effects on existing facilities as a consequence of the proposed construction.

- o Exhibit Z-1 discusses the environmental considerations that relate to location of the proposed facilities.
- o Exhibit Z-9 discusses the engineering and design criteria that relate to the route selection and facility design.

2.1 PIPELINE GENERAL DESCRIPTION

The map in Figure F-2-1 shows the proposed pipeline route, originating at Prudhoe Bay in northern Alaska corresponding to Milepost O. The pipeline connects at this originating point to the Prudhoe Bay gas conditioning plant through the metering station at this location.

The pipeline route runs adjacent to the Trans Alaska Pipeline System (TAPS) in a southerly direction to about Milepost 274 near Prospect Creek. The pipeline then turns in a southeasterly direction to about Milepost 535 at Delta Junction.

At Delta Junction the line diverges from the TAPS route, and continues in a southeasterly direction to the Alaska/Yukon border at about Milepost 743. At this point at the Yukon metering station, the Alaska Segment of the pipeline connects to the Canadian Segment.

The total pipeline length is approximately 743 miles, consisting of 48-inch O.D. pipe operating at 1260 psig design pressure. The pipeline will be buried except for 3 aerial crossings.

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2.2 COMPRESSOR STATIONS

The map in Figure F-2-1 displays the locations for the compressor stations. In order to transport the design flow rate of 2,000 MMSCFD, seven compressor stations are planned as shown (Stations 2, 4, 7, 9, 11, 13, and 15). Nine other compressor station sites are also identified on the map, representing locations for future system expansion, providing a total of sixteen locations as shown on the map.

Additional design data concerning the compressor stations is provided in Exhibits G, G I and G II, including their locations and size (rated horsepower).

Also shown are the connections at the Prudhoe Bay purchase point and the sales point at the Alaska/Yukon border, together with the location of intermediate points of connection within Alaska.

2.3 METER STATIONS

Meter stations are provided at two locations; the gas receipt point at Prudhoe Bay and the delivery point to the Canadian Segment at the Yukon border. Exhibits G and Z-9.2 provide additional data concerning the Meter Station design.

2.4 OTHER PLANNED FACILITIES

The map in Figure F-2-1 also shows the location of other planned facilities, including the construction camps and airfields, commercial and military airfields, and the Fairbanks Headquarters.

The Operations Control Center (OCC) will be located at Fairbanks, and will monitor and control pipeline operation from that point.

Other related facilities are discussed in the other exhibits referenced in 2.0 above, including the communications system, material sites, pipeline double-jointing facilities, material storage yards, and Operating and Maintenance Facilities.

EXHIBIT F

LOCATION OF FACILITIES

The location of the proposed pipeline and related facilities to be constructed are generally described in this Exhibit. These facilities constitute the Alaska Segment of the Alaska Natural Gas Transportation System (ANGTS), extending from Prudhoe Bay to the Alaska/Yukon border.

1.0 RELATIONSHIP TO THE ANGTS

Figure F-1-1 displays the total ANGTS, including the Alaska Segment, the Canadian Segment, and the two Lower 48 Segments (Eastern Leg and Western Leg). This map shows the relationship of the Alaska Segment, consisting of about 743 miles of pipeline, to the total ANGTS, which extends over a route of approximately 4,800 miles.

The pipeline system is designed for an initial annual average flowrate of 2,000 million standard cubic feet per day (MMSCFD) of natural gas from the Prudhoe Bay field, with 70 percent of the gas delivered to the Eastern Leg, and 30 percent to the Western Leg.

The Alaska Segment can transport up to 3,200 MMSCFD through the addition of nine intermediate compressor stations.

EXHIBIT F-I

FACTORS CONSIDERED IN USE OF

JOINT RIGHTS-OF-WAY

Consistent with good pipelining practice, in order to minimize ecological disturbances in the area of the pipeline, to facilitate the acquisition of rights-of-way, and to ease or eliminate pipeline construction and operating difficulties, existing rights-of-way and areas adjacent to existing rightsof-way will be utilized to the maximum extent practical.

1.0 PIPELINE ROUTE

Exhibit Z-1 (Environmental Engineering Manual), Exhibit Z-6 (Alignment Sheets) and Exhibit Z-9 (Design Manual) of this application provide a detailed description of the rights-of-way which will be used, and contain alignment drawings and maps showing other facilities in the area including unrelated pipelines, electric power lines, highways and railroads.

The route of the proposed pipeline was selected so that the line will be constructed adjacent to the existing Trans Alaska Pipeline System (TAPS), the Prudhoe Bay Haul Road and the Golden Valley Electric Association's power line, where feasible, from Prudhoe Bay to Delta Junction, a distance of approximately 548 miles. From Delta Junction, the pipeline will generally follow the Alaska Highway and the Haines Pipeline corridor to the Alaska/Yukon border, a distance of approximately 195 miles.

2.0 USE OF EXISTING RIGHTS-OF-WAY

The proposed joint use of rights-of-way includes the Haines Pipeline and portions of the TAPS anticipated permanent right-of-way. The primary reason for their use is to utilize the existing utility corridor and to avoid the proliferation of right-of-way "scars" across the landscape. Joint use of these rights-of-way also reduces cost by utilizing existing clearing and grading.

3.0 USE OF EXISTING FACILITIES

Use of existing facilities is described in detail in the Exhibits referenced in Paragraph 1.0, Pipeline Route. A summary of these facilities follows:

- The existing right-of-way for the Haines Pipeline will be used in selected locations south of Fairbanks, and also south of Delta.
- o The Prudhoe Bay Haul Road will be used for regional access north of the Yukon River.
- o The Elliott Highway will be used for regional access north of Fairbanks.
- o The Richardson Highway will be used for regional access south of Fairbanks.
- o The Alaska Highway will be used for regional access south of Delta.
- The existing workpad, built for the TAPS oil pipeline, or new extensions thereto, will be used for construction adjacent to the TAPS pipeline where possible.
- o The gas pipeline will cross the Yukon River utilizing the existing bridge.
- Existing secondary roads will be used for pipeline access to the greatest extent possible.
- Existing gravel pits, if available, will be used for a source of construction materials.
- Existing camps along the proposed gas pipeline route will be used for temporary construction facilities to the greatest extent posssible.

3.0 USE OF EXISTING FACILITIES (Continued)

- Fort Wainwright will be used for temporary construction facilities.
- Airstrips and material storage yards from the TAPS facilities will be utilized to the greatest extent possible.
- South of Fairbanks, existing airfields at Tanacross and Northway will service the Sears Creek, Tok and Northway camps. The military airfield at Fort Greely (Allen Army Airfield) will service the Delta camp. The Fairbanks International Airport will be used as the project central airfield for major traffic operations. Commercial air carriers will be used whenever possible.
- The existing Alaskan infrastructure will be utilized to the maximum practical extent, including use of existing highways, railroads, road transport services, commercial communication systems and seaports such as Seward, Anchorage, Valdez and Prudhoe Bay.

4.0 ROUTING DEVIATIONS

Applicant intends to use the rights-of-way and facilities as described as of the date of this filing, or amendment or supplement thereto. However, it is understood that the actual construction of the proposed facility may require deviations because of unanticipated obstacles or difficulties, including those encountered due to terrain features, environmental and cultural resource considerations, socioeconomic or other events that may occur subsequently.

EXHIBIT F-II

FACTORS CONSIDERED IN LOCATING FACILITIES

IN SCENIC HISTORIC RECREATIONAL OR

WILDLIFE AREAS

Applicant states that the proposed Alaska Segment of the Alaska Natural Gas Transportation System, as proposed, will be routed through the northern edge of the Tetlin National Wildlife Refuge. This particular routing was planned prior to the establishment and dedication of the Refuge, and there is no reasonable alternative available. Any other routing for the pipeline to bypass the Refuge, would involve substantial additional environmental damage (i.e., longer access roads, more pad materials and encroachment into undisturbed areas) because the pipeline would not then be making use of existing rights-of-way through the area. These rights-of-way include the Alaskan Highway and the former Haines-Fairbanks oil pipeline corridor, within which the gas pipeline will be constructed. The Department of Interior, which has jurisdiction over this area has been consulted. In a letter to Northwest dated January 11, 1980 (AL01.0101), Interior's Authorized Officer, Mr. William M. Toskey, stated: "It is the intent of the Department to act as expeditiously as possible to issue a right-of-way grant for the construction of the proposed pipeline across the proposed Tetlin National Wildlife Refuge " Applicant believes that the extensive stipulations for environmental protection to be attached to the right-of-way grant by the Department, and made applicable to other pipeline construction activities in Alaska, are adequate to encompass construction in the Tetlin Refuge. These stipulations, worked out over a two-year period with all concerned Federal agencies -- and specifically including the U.S. Fish and Wildlife Service-are one of the bases for applicant's cost estimate and other planning. Site-specific stipulations, specifically for the Refuge, are not expected to impose any highly unusual requirements, and the general nature of construction in that area should be essentially the same as elsewhere.

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EXHIBIT F-III

STATEMENT ON ADOPTION OF GUIDELINES CONCERNING RIGHTS-OF-WAY AND CONSTRUCTION ACTIVITIES

Applicant states that the guidelines concerning the right-ofway and construction activities set forth in Section 2.69 of Chapter I, Title I, 18 C.F.R. have been adopted by the applicant, that the relevant portions thereof will be issued to planning, construction personnel, contractors, and subcontractors on a continuing basis throughout the life of the project.

The Section 2.69 guidelines are similar in many respects to the draft Department of the Interior (DOI) stipulations expected to be attached to the Federal grant of right-of-way to be issued to Applicant with respect to Federal lands in Alaska. These stipulations provide detailed guidelines dealing with <u>inter alia</u>, environmental and technical matters. Applicant does <u>not</u> perceive any conflicts between these stipulations and the Section 2.69 guidelines. The DOI stipulations, in general, may be viewed as a more detailed elaboration of the Section 2.69 guidelines.

Several of the draft DOI stipulations, which the Applicant has adopted for planning purposes, are particularly germane to the manner in which environmental protection requirements will be implemented with respect to construction personnel and contractors.

A pertinent example is as follows:

"1.2.1 The following conditions shall apply to the design construction, operation, maintenance, and termination of the PIPELINE SYSTEM. Unless clearly inapplicable, the requirements and prohibitions imposed upon the COMPANY by these Stipulations are also imposed upon the COMPANY'S agents, employees, contractors, and subcontractors, and the employees of each of them.

(1) The COMPANY shall ensure compliance with these Stipulations by its agents, employees, and contractors (including subcontractors at any level), and the employees of each of them.

- (2) Failure or refusal of the COMPANY'S agents, employees, contractors, subcontractors, or their employees to comply with these Stipulations shall be deemed to be the failure or refusal of the COMPANY.
- (3) Where appropriate the COMPANY shall require its agents, employees, contractors, subcontractors to include these Stipulations in all contracts and subcontracts which are entered into by any of them, together with a provision that the other contracting party, together with its agents, employees, contractors and subcontractors, and the employees to each of them, shall likewise be bound to comply with these Stipulations."

It is the Applicant's intention to require its employees, contractors, subcontractors, and other associated personnel to observe the same high standards of environmental protection at all locations--regardless of land ownership.

EXHIBIT F-IV

STATEMENTS BY THE APPLICANT CONCERNING THE REQUIREMENTS

OF THE NATIONAL ENVIRONMENTAL POLICY

ACT OF 1969, PUBLIC LAW 91-190,

83 STAT. 852, TITLE I, SECTION 102

The President of the United States, in his <u>Decision and</u> <u>Report to Congress on the Alaskan Natural Gas Transportation</u> <u>System submitted September 22, 1977, made the following</u> statement:

"The President hereby determines pursuant to the direction of Section 8 (e) of ANGTA (The Alaskan Natural Gas Transportation Act of 1976), that the required environmental impact statements relative to an Alaska natural gas transportation system have been prepared, that they have been certified by the CEQ and that they are in compliance with the National Environmental Policy Act of 1969.

Consequently the enactment of a joint resolution approving the Decision shall be conclusive as to the legal and factual sufficiency of the final environmental impact statements as provided by Section 10 (c) (3) of ANGTA."

Subsequently, on November 8, 1977, a joint resolution of the Congress was enacted (Pub. L. 95-158) which reads as follows:

"Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, that the House of Representatives and Senate approve the Presidential decision on an Alaska natural gas transportation system submitted to the Congress on September 22, 1977, and find that any environmental impact statements prepared relative to such system and submitted with the President's decision are in compliance with the Natural Environmental Policy Act of 1969."

As a result of the extensive planning actions and data-gathering field programs conducted since November, 1977, Applicant has encountered nothing that would invalidate or tend to invalidate any of the fundamental conclusions reached in the environmental review process, cited above, that resulted in the <u>President's</u> Decision and the joint resolution by Congress.

Accordingly, Applicant believes that no additional regulatory action is required by FERC pursuant to the requirement of the National Environmental Policy Act of 1969, Public Law 91-190, 83 Stat. 852, Title I, Section 102, pursuant to Title 18 CFR, Section 157.14(a)(6-d).

EXHIBIT G

FLOW DIAGRAMS SHOWING DAILY DESIGN CAPACITY AND REFLECTING OPERATION WITH AND WITHOUT PROPOSED FACILITIES ADDED

1.0 FLOW DIAGRAMS

Four flow diagrams are presented for the purpose of illustrating pipeline capacity in Prudhoe Bay flowrates:

- 1. Summer Average at 2000 MMSCFD
- 2. Winter Average at 2000 MMSCFD
- 3. Summer Maximum at 2393 MMSCFD
- 4. Winter Maximum at 2533 MMSCFD

An engineering analysis of the system concluded that for these flowrates, the installation of seven compressor stations is required at an average spacing of ninety-eight miles. Each compressor station will be equipped with a single pipeline gas compressor unit, pipeline gas refrigeration units and on-site power generation. Compressors (both gas and refrigerant) and generators will be driven by gas turbine prime movers.

1.1 SUMMER AND WINTER AVERAGE FLOWRATES

The Alaska Segment operating conditions at 2000 MMSCFD annual average flow from the Prudhoe Bay gas conditioning plant are presented on the following two pages (Drawing Numbers 4680-10-00-0-001 and 4680-10-00-0-002). Summer and winter operating conditions are illustrated respectively on these drawings. These drawings show gas temperature, pressure and flowrate at every station. In addition, mainline compressor and refrigeration loads and station fuel consumptions are presented. The station fuel consumptions include the fuel requirements for the mainline turbo-compressor, refrigeration equipment, electric power generator and support facilities.

1.2 SUMMER AND WINTER MAXIMUM FLOWRATES

The Alaska Segment maximum capacity operating conditions with seven stations are shown on the following two pages (Drawing Numbers 4680-10-00-0-003 and 4680-10-00-0-004). The operating conditions for summer and winter seasons are given on separate drawings. The Segment maximum capacity of the initial system was determined by the mainline compressor driver available horsepower and refrigeration equipment capacity.

1.2 SUMMER AND WINTER MAXIMUM FLOWRATES (Continued)

The Segment is capable of receiving 2393 MMSCFD gas during summer and 2533 MMSCFD gas during winter from Prudhoe Bay. Under these conditions, the gas delivery capability to the Alaska-Yukon border will be 2311 MMSCFD during summer and 2464 MMSCFD during winter.

M.S. 80.1 .B.	61.2	c.	ATIGUN PASS M.P. 172-9	6	c.s.7	107.0	YUKON RIVER M.P. 361.5	c.s.9 11	3.2 C.S det synke ter det synke t	DELTA JOT. TAP	DELTA GRAIN DRYER TAP	995 	001 LAKE TAP M.P. 607	dFT NOT A.M. 2.0 WWSCED	S.15 58.2	MWSCED	YI
TOTAL 743.1 MILES. 48" O.D. PIP	ELINE, WAL	L THICKNES	S • 0.6 IN	ICH MINIMUM								- <u>-</u>					
STATION DESIGNATION	M-S-PRUDHOE BAY	C.S. I	C.S. 2	C.S. 3	C.S. 4	C.S. 5	C.S. 6	C.S. 7	C.S. 8 C.S. 9	C.S. 10	C.S. 11	C.S. 12	C.S. 13	C.S. 14	C.S. 15	C.S. 16	M.S. 1
MILEPOST (MILES)	0.0		80+1		4 .3			273.9	380.9		494.1		579.7		684.9		743
ELEVATION (FEET)	21		825		3050			1315	880		715		300		2000		21
STATION INLET VOLUME (MMSCF/D)	2000.00		2000.00		1996.77			1992.57	1987.31		1957.08		1946.04		1938.06		93 .
TOTAL FUEL (MMSCF/D)			3.23		4.20			5.26	5.23		5.84		5.78		6.04		
NET VOLUME TO PIPELINE (MMSCF/D)	2000.00		1996.77		1992.57			1987.31	1982.08		1951-24		1940.26		1932.02		1931.
STATION SUCTION PRESSURE (PSIG)	1259.5		1093.0		1070.2			1097.8	1088.5		1061.1		1097.5		1063.8		115
STATION SUCTION TEMPERATURE (°F)	30		20.7		19.7			30.8	31.0		31.2		29.6		31.0		28
STATION DISCHARGE PRESSURE (PSIG)	1259.5		1259.8		1251.9			1253.0	1251.3		1260.0		1259.8	<u> </u>	1252.8		115
	30		31.7		22.9			20.4	22.7	1 1	24.8		16.5	ļ	20.4		28
STATION DISCHARGE TEMPERATURE (°F)				,	1 179		I _	1.150	1.158		1.196		1.157		1.186		<u> </u>
STATION DISCHARGE TEMPERATURE (°F) COMPRESSION RATIO			1.161		1+115						14171	1	1 1 1 7 0	1	1 10 10 10 10	1 1	
STATION DISCHARGE TEMPERATURE (°F) COMPRESSION RATIO HORSEPOWER REQUIRED			1.161		12487			11054	11632		14[3]		11178		13270		
STATION DISCHARGE TEMPERATURE (°F) COMPRESSION RATIO HORSEPOWER REQUIRED HORSEPOWER SPARE			1.161 11351 14709		12487 12083			11054	11632		14131		13612		1 32 70		
STATION DISCHARGE TEMPERATURE (°F) COMPRESSION RATIO HORSEPOWER REQUIRED HORSEPOWER SPARE HORSEPOWER INSTALLED-SITE RATED			1.161 11351 14709 26060		12487 12083 24570			11054 13826 24880	11632 13378 25010		14131 11079 25210		13612 24790		1 32 70 1 0990 24260		
STATION DISCHARGE TEMPERATURE (°F) COMPRESSION RATIO HORSEPOWER REQUIRED HORSEPOWER SPARE HORSEPOWER INSTALLED-SITE RATED NO. OF UNITS INSTALLED			1.161 11351 14709 26060 1		12487 12083 24570			11054 13826 24880 1	11632 13378 25010 1		14131 11079 25210 1		11178 13612 24790 1		13270 10990 24260 1		
STATION DISCHARGE TEMPERATURE (°F) COMPRESSION RATIO HORSEPOWER REQUIRED HORSEPOWER SPARE HORSEPOWER INSTALLED-SITE RATED NO. OF UNITS INSTALLED STANDARD ISO RATING OF UNITS			1.161 11351 14709 26060 1 26500		12487 12083 24570 1 26500			11054 13826 24880 1 26500	11632 13378 25010 1 26500		14(3) 11079 25210 1 26500		11178 13612 24790 1 26500		13270 10990 24260 1 26500		
STATION DISCHARGE TEMPERATURE (°F) COMPRESSION RATIO HORSEPOWER REQUIRED HORSEPOWER SPARE HORSEPOWER INSTALLED-SITE RATED NO. OF UNITS INSTALLED STANDARD ISO RATING OF UNITS COMPRESSOR SUCTION PRESSURE (PSIG)			1.161 11351 14709 26060 1 26500 1087.0		12487 12083 24570 1 26500 1064.2			11054 13826 24880 1 26500 1091.8	11632 13378 25010 1 26500 1082.5		14131 11079 25210 1 26500 1055.1		11178 13612 24790 1 26500 1091.5		13270 10990 24260 1 26500 1057.8		
STATION DISCHARGE TEMPERATURE (°F) COMPRESSION RATIO HORSEPOWER REQUIRED HORSEPOWER SPARE HORSEPOWER INSTALLED-SITE RATED NO. OF UNITS INSTALLED STANDARD ISO RATING OF UNITS COMPRESSOR SUCTION TEMPERATURE (°F) COMPRESSOR SUCTION TEMPERATURE (°F)			1.161 11351 14709 26060 1 26500 1087.0 20.3		12487 12083 24570 1 26500 1064.2 19.3			11054 13826 24880 1 26500 1091.8 30.5	11632 13378 25010 1 26500 1082.5 30.6 1255.7		14131 11079 25210 1 26500 1055.1 30.9		11178 13612 24790 1 26500 1091.5 29.2		13270 10990 24260 1 26500 1057.8 30.6		
STATION DISCHARGE TEMPERATURE (°F) COMPRESSION RATIO HORSEPOWER REQUIRED HORSEPOWER SPARE HORSEPOWER INSTALLED-SITE RATED NO. OF UNITS INSTALLED STANDARD ISO RATING OF UNITS COMPRESSOR SUCTION PRESSURE (PSIG) COMPRESSOR DISCHARGE PRESSURE (PSIG)			1.161 11351 14709 26060 1 26500 1087.0 20.3 1264.8		12487 12083 24570 1 26500 1064.2 19.3 1256.9			11054 13826 24880 1 26500 1091.8 30.5 1258.0	11632 13378 25010 1 26500 1082.5 30.6 1256.3 50.1		14131 11079 25210 1 26500 1055.1 30.9 1265.1 54.7		11178 13612 24790 1 26500 1091.5 29.2 1264.8		13270 10990 24260 1 26500 1057.8 30.6 1257.2		
STATION DISCHARGE TEMPERATURE (°F) COMPRESSION RATIO HORSEPOWER REQUIRED HORSEPOWER SPARE HORSEPOWER INSTALLED-SITE RATED NO. OF UNITS INSTALLED STANDARD ISO RATING OF UNITS COMPRESSOR SUCTION PRESSURE (PSIG) COMPRESSOR DISCHARGE PRESSURE (PSIG) COMPRESSOR DISCHARGE TEMPERATURE (°F)			1.161 11351 14709 26060 1 26500 1087.0 20.3 1264.8 39.7 2109		12487 12083 24570 1 26500 1064.2 19.3 1256.9 40.7			1054 3826 24880 26500 091.8 30.5 258.0 49.0 766	11632 13378 25010 1 26500 1082.5 30.6 1256.3 50.1 7771		14131 11079 25210 1 26500 1055.1 30.9 1265.1 54.7 7751		11178 13612 24790 1 26500 1091.5 29.2 1264.8 48.4 8477		13270 10990 24260 1 26500 1057.8 30.6 1257.2 53.3 8536		
STATION DISCHARGE TEMPERATURE (°F) COMPRESSION RATIO HORSEPOWER REQUIRED HORSEPOWER SPARE HORSEPOWER INSTALLED-SITE RATED NO. OF UNITS INSTALLED STANDARD ISO RATING OF UNITS COMPRESSOR SUCTION PRESSURE (PSIG) COMPRESSOR DISCHARGE TEMPERATURE (°F) COMPRESSOR DISCHARGE TEMPERATURE (°F) COOLING LOAD (TONS) PEEDLOEDATION HORSEDDWED PEAULOED			1.161 11351 14709 26060 1 26500 1087.0 20.3 1264.8 39.7 2109		12487 12083 24570 1 26500 1064.2 19.3 1256.9 40.7 4824 4593			11054 13826 24880 1 26500 1091.8 30.5 1258.0 49.0 7668 9570	11632 13378 25010 1 26500 1082.5 30.6 1256.3 50.1 7271 8887		14131 11079 25210 1 26500 1055.1 30.9 1265.1 54.7 7751 9263		11178 13612 24790 1 26500 1091.5 29.2 1264.8 48.4 8477 11376		13270 10990 24260 1 26500 1057.8 30.6 1257.2 53.3 8536 10665		
STATION DISCHARGE TEMPERATURE (° F) COMPRESSION RATIO HORSEPOWER REQUIRED HORSEPOWER SPARE HORSEPOWER INSTALLED-SITE RATED NO. OF UNITS INSTALLED STANDARD ISO RATING OF UNITS COMPRESSOR SUCTION PRESSURE (PSIG) COMPRESSOR DISCHARGE PRESSURE (PSIG) COMPRESSOR DISCHARGE TEMPERATURE (°F) COOLING LOAD (TONS) REFRIGERATION HORSEPOWER REQUIRED			1.161 11351 14709 26060 1 26500 1087.0 20.3 1264.8 39.7 2109 1935		12487 12083 24570 1 26500 1064.2 19.3 1256.9 40.7 4824 4593			11054 13826 24880 1 26500 1091.8 30.5 1258.0 49.0 7668 9570	11632 13378 25010 1 26500 1082.5 30.6 1256.3 50.1 7271 8987		14131 11079 25210 1 26500 1055.1 30.9 1265.1 54.7 7751 9263		11178 13612 24790 1 26500 1091.5 29.2 1264.8 48.4 8477 11376		13270 10990 24260 1 26500 1057.8 30.6 1257.2 53.3 8536 10665		

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	TOTAL 743.1 MILES, 48" O.D. PIP	ELINE. WAL	L THICKNES	S - 0.6 IN	CH MINIMUM	4													
	STATION DESIGNATION	N.S.PRUDHOE BAY	C.S. 1	C.S. 2	C.S. 3	C.S. 4	C.S. 5	C.S. 6	C.S. 7	C.S. 8	C.S. 9	C.S. 10	C.S. 11	C.S. 12	C.S. 13	C.S. 14	C.S. 15	C.S. 16	M.S. YUKON
	MILEPOST (MILES)	0.0		80.1		141.3			273.9		380.9		494.1		579.7		684.9		743.1
	ELEVATION (FEET)	21		825		3050			1315		880	1	715		1300		2000		2120
	STATION INLET VOLUME (MMSCF /D)	2000.00		1999.90		1997.35			1994.56		1992.42		1964.94		1956.60		1951.75		1947.67
R	TOTAL FUEL (MMSCF/D)	0.10		2.55		2.79			2.14		2.48		3,14		2.65		3.08		0.10
ATI	NET VOLUME TO PIPELINE (MMSCF/D)	1999.90		1997.35		1994.56			1992.42		1989.94		1961.80		1953.95		1948.67		1947.57
ST.	STATION SUCTION PRESSURE (PSIG)	1260.0		1095.8		1070.7			1114-6		1096.4		1067.0		1097.6		1062.6		1157.4
	STATION SUCTION TEMPERATURE (°F)	30.0		13.3		9.1			9.5		15.1		17.5		19.2		16.5		21.9
	STATION DISCHARGE PRESSURE (PSIG)	1260.0		1260.0		1252.6			1253.2		1252.2		1260.0		1260.0		1252.7		1153.4
	STATION DISCHARGE TEMPERATURE (°F)	30.0		31.6		29.4			24.8		31.1		32.0		31.6		31.2		21.9
	COMPRESSION RATIO			1.159		1.179			1.133		1.151		1.190		1.157		1.188		
	HORSEPOWER REQUIRED			10747		11829			8834		10301		12894		10718		12619		
-	HORSEPOWER SPARE			16523		12981			18126		17209		14716		16552		13521		
0	HORSEPOWER INSTALLED-SITE RATED			27270		24810			26960		27510		27610		27270		26140		
SS	NO. OF UNITS INSTALLED			1		1			I				I				I		
PR	STANDARD ISO RATING OF UNITS			26500		26500			26500		26500		26500		26500		26500		
₹	COMPRESSOR SUCTION PRESSURE (PSIG)			1089.8		1064.7			1108.6		1090.4		1061+0		1091.6		1056.6		
	COMPRESSOR SUCTION TEMPERATURE (.F)		[12.9		8.7			9.2		4.7		17.1		18-8		16.1		
	COMPRESSOR DISCHARGE PRESSURE (PSIG)			1265.1		1257.6			1258.2		1257.2		1265.2		1265.2		1257.7		
	COMPRESSOR DISCHARGE TEMPERATURE (*F)			31.6		29.4			24.8		32.6		39.6		37.6		38.3.		
	COOLING LOAD (TONS)			0		0		4	0		376		1989		1560		1828		
100	REFRIGERATION HORSEPOWER REQUIRED			0		0	T		0		92		490		392		469		
EFI																			
100																		1	1

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			0.A.C.			РИМИЧЕТАТИТ ВУ БАЛЬ СОМРАНТ ОВ ВУ ТИТОР РИТТЕСТ МО РИМИЗЕЩС ЗОНИ ПАРОМАТСИ ТО ТУВ СОМРИЧЕТИВИМИТ ТО А LICENSE ОВ МЕ АНТИНЕТИТ ТО ТРЕ СОМРИЧЕТИВИМИТ ТО А ЦИСКИ ОВ АНТИНЕТИВИТ ТО ТОВ СОМРИТЕНИИ СОМГАТИВИ ТИТЕ ВИКОМАНИСТИКИ ПО СОМРЕТИВИТАТА АПКАЛИ ГОЛИЧЕТАТИ ТО АЛУКИ ОВ АНТИНЕТИВИ ТО ОВ АНТИНЕТИКА ПО АЛИКАТИ ПО ОПТАТИВИ В АПТЕЗ ОМИКИТАТИ СА ДО ОВСЕДИИТЕ Г НАГОЗИЛА СОМТАТИВИ В АПТЕЗ ОМИКИТАТИ СТАЛИКИ НЕ РИМИТАТИ	ALASKA SEGMENT OF W.O'BELMITO	THE ALASKA NATURAL GAS TRANSPORTATION S 3-10-80 Report G. Long Date 4-18 N. 79/2014 / Date 1 / (<u>SYSTEM</u> B - 80
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	TOTAL 743.1 MILES. 48" O.D. PIP	ELINE. WAL	L THICKNES	SS - 0.6 IN	ICH MINIMUN	4													
	STATION DESIGNATION	M.S.PRUDHOE BAY	C.S. 1	C.S. 2	C.S. 3	C.S. 4	C.S. 5	C.S. 6	C.S. 7	C.S. 8	C.S. 9	C.S. 10	C.S. 11	C.S. 12 .	C.S. 13	C.S. 14	C.S. 15	C.S. 16	M.S. YUKON
	MILEPOST (MILES)	0.0		80.1		141.3			273.9		380.9		494.1		579.7		684.9		743.1
	ELEVATION (FEET)	21		825		3050			1315		880		715		1300		2000		2120
	STATION INLET VOLUME (MMSCF/D)	2392.97		2392.97		2388.12			2383.14		2375.64		2342.63		2329.93		2319.87		2311.30
NO	TOTAL FUEL (MMSCF/D)			4.85		4.98			7.50	1	10.8		7.50		7.86		7.57		1
ATI	NET VOLUME TO PIPELINE (MMSCF/D)	2392.97		2388.12		2383.14			2375.64		2367.63		2335.13		2322.07		2312.30		2311.30
ST.	STATION SUCTION PRESSURE (PSIG)	1259.7		1030.5		1024.4			978.0		979.5		956.4		984.5		974.2		1098.6
	STATION SUCTION TEMPERATURE (*F)	30.0		17.2		16.9			26.6		29.2		27.6		28.1		29.7		31.0
	STATION DISCHARGE PRESSURE (PSIG)	1259.7		1260.0		1253.3			1245.1		1249.6		1225.0		1260.0		1238-8		1092.6
	STATION DISCHARGE TEMPERATURE (*F)	30.0		31.7		28.8			29.8		29.3		31.8		28.8		30.2		31.0
_	COMPRESSION RATIO			1.238	1	1.239			1.289		1.291		1.297		1.295		1.287		
	HORSEPOWER REQUIRED			19562		19580			24625		25019		25067		24707		24205		
z	HORSEPOWER SPARE			6498		4990			255				43		83		55		
0I	HORSEPOWER INSTALLED-SITE RATED			26060		24570			24880		25010		25210		24790		24260		
ESS	NO. OF UNITS INSTALLED			I		I			1]		1 I		1		1		
PR	STANDARD ISO RATING OF UNITS			26500		26500			26500		26500		26500		26500		26500		
CON	COMPRESSOR SUCTION PRESSURE (PSIG)			1021.5		1015.4			969.0		970.5		947.4		975.5		965.2		
-	COMPRESSOR SUCTION TEMPERATURE (.F)			16.6		16.3			26.0		28.6		27.0		27.6		29.1		
	COMPRESSOR DISCHARGE PRESSURE (PSIG)			1268.0		1261.3			1253.1		1257.6		1233.0		1268.0		1246.8		
	COMPRESSOR DISCHARGE TEMPERATURE (*F)			44.4		44.2			60.0		63.1		62.1		62.4		63.3		
	COOLING LOAD (TONS)			3995		4840			9273		10349		9028		10143		9825		
RIC	REFRIGERATION HORSEPOWER REQUIRED			3668		4113			9928		11498		9624		11208		10453		
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PRUDHOE BAY W.P. 0.0 M.P. 0.0	BO.1	1.2	C.	ATTGUN PASS	5	c.s.7	107.0	YUKON RIVER M.P. 361.5	c.s.9	3.2 Later Action 199 -	C.S.	MMSCED	5.0 DELTA GRAIN DRYER TAP	995 d W #SCFD 0.2	MMSCFD	2.0 MMSCFD	S.15 58.2	•0 WM2CED	M.S. YUKON BORDER
ТО	DTAL 743.1 MILES, 48" O.D. PIP	ELINE, WAL	L THICKNES	S - 0.6 IN	CH MINIMUM								<u> </u>						
ST	ATION DESIGNATION	N-S-PRIJOHOE BAY	C.S. I	C.S. 2	C.S. 3	C.S. 4	C.S. 5	C.S. 6	C.S. 1	C.S. 8	C.S. 9	C.S. 10	C.S. 11	C.S. 12	C.S. 13	C.S. 14	C.S. 15	C.S. 16	M.S. YUKON
MI	LEPOST (MILES)	0.0		80.1		141.3			273.9		380.9		494.1		579.7		684.9		743.1
EL	EVATION (FEET)	21		825		3050			1315		880		715		1300		2000		2120
ST	ATION INLET VOLUME (MMSCF/D)	2532.62		2532.52		2528.20			2524.02		2519.08		2488.88		2478.27		2470.66		2464.50
N TC	TAL FUEL (MMSCF/D)	0.10		4.32		4.18			4.94		5.20		5.41		5.41		5.16		0.10
I NE	T VOLUME TO PIPELINE (MMSCF/D)	2532.52		2528.20		2524.02			2519.08		2513.88		2483.47		2472.86		2465.50		2464.40
5 ST	ATION SUCTION PRESSURE (PSIG)	1260.0		1008.5		1007.3			963.6		968.7		934.3		963.0		946.2		1070.4
ST	ATION SUCTION TEMPERATURE (°F)	30.0		9.5		6.6			4.1		12.2		10.9		14.0		11.4		19.3
ST	ATION DISCHARGE PRESSURE (PSIG)	1260.0		1260.0		1255.8			1254.8		1253.3		1227.2		1260.0		1228.2		1064.4
ST	ATION DISCHARGE TEMPERATURE (°F)	30.0		31.4		29.7			31.4		31.1		31.7		31.5		31.2		19.3
CC	MPRESSION RATIO			1.266		1.263			1.319		1.311		1.331		1.326		1.316		
нс	DRSEPOWER REQUIRED			22241		21670			25850		26177		27483		27139		26087		
Z HC	RSEPOWER SPARE			5029		3140			1110		1333		27		131		53		
A HC	RSEPOWER INSTALLED-SITE RATED			27270		24810			26960		27510		27610		27270		26140		
S NC	. OF UNITS INSTALLED			<u> </u>		1			1				1				l i		
ST	ANDARD ISO RATING OF UNITS			26500		26500			26500		26500		26500		26500		26500		
00 Š	MPRESSOR SUCTION PRESSURE (PSIG)			998.5		997.3			953.6		958.7		924.3		953.0		936.2		
CC	MPRESSOR SUCTION TEMPERATURE (•F)			8.8		5.9			3.4		11.5		10.2		3.4		10.7		
CO	MPRESSOR DISCHARGE PRESSURE (PSIG)			1268.1		1263.8			262.8		1261.3		1235.2		1268.3		1236.2		
CO	MPRESSOR DISCHARGE TEMPERATURE (°F)			39.1		35.7			38.9		46.7		47.5		50.1		46.4		
.; C(DOLING LOAD (TONS)			2558		1964			2455		5148		5066		6021		4868		
RE	FRIGERATION HORSEPOWER REQUIRED			651		496			624		1329		1265		1522		1250		
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EXHIBIT G-I

FLOW DIAGRAMS REFLECTING MAXIMUM CAPABILITIES

1.0 FLOW DIAGRAMS - MAXIMUM CAPABILITIES

The maximum capabilities of the Alaska Segment can be achieved by increasing the number of compressor stations to sixteen. The additional compressor stations will be of comparable design to the initial ones. They will be equipped with a single pipeline gas compressor unit, pipeline gas refrigeration units and on-site power generation. Compressors (both gas and refrigerant) and generators will be driven by gas turbine prime movers.

1.1 FLOW DIAGRAM - MAXIMUM CAPABILITY AFTER EXPANSION

The following flow diagram (Drawing Number 4680-10-00-0-005) shows operating conditions under Alaska Segment maximum capabilities during winter after expansion. The maximum capability is based on a sixteen station installation. The additional nine compressor stations after expansion will have the same equipment rating as the initial seven compressor stations.

After expansion, the Segment will be capable of receiving 3205 MMSCFD gas during winter from Prudhoe Bay with a delivery of 3096 MMSCFD gas to the Alaska-Yukon border.



	TOTAL 743.1 MILES. 48" O.D. PIP	ELINE. WAL	L THICKNES	S - 0.6 IN	CH MINIMUM														
	STATION DESIGNATION	N.S.PRUDHOE BAY	C.S. 1	C.S. 2	C.S. 3	C.S. 4	C.S. 5	C.S. 6	C.S. 7	C.S. 8	C.S. 9	C.S. 10	C.S. 11	C.S. 12	C.S. 13	C.S. 14	C.S. 15	C.S. 16	M.S. YUKON
	MILEPOST (MILES)	0.0	44.5	80.1	113.7	141.3	179.1	235.0	273.9	320.7	380.9	432.1	494.1	534.9	579.7	634.3	684.9	731.1	743.1
	ELEVATION (FEET)	21	362	825	1525	3050	3158	1220	1315	1730	880	1520	715	977	1300	1860	2000	2250	2120
1	STATION INLET VOLUME (MMSCF/D)	3205.05	3204.95	3200.17	3196.11	3192.11	3188.08	3184.42	3180.52	3176.62	3171.51	3166.25	3136.02	3130.62	3119.95	3114.34	3107.29	3101.13	3096.00
NO	TOTAL FUEL (MMSCF /D)	0.10	4.78	4.06	4.00	4.03	3,66	3.90	3.90	5.11	5.26	5.23	5.40	5.47	5.41	5.05	5.16	5.13	0.10
AT	NET VOLUME TO PIPELINE (MMSCF/D)	3204.95	3200.17	3196.11	3192.11	3188.08	3184.42	3 80.52	3176.62	3171.51	3166.25	3161.02	3130.62	3125.15	3114.54	3109.29	3102.13	3096.00	3095.90
ST	STATION SUCTION PRESSURE (PSIG)	1260.0	1051.9	1087.5	1086.8	1080.6	1091.4	1089.1	1090.5	1037.8	1032.4	1007.3	982.2	978.3	1028.0	1007.0	999.4	1004.1	1174.1
	STATION SUCTION TEMPERATURE (°F)	30.0	14.6	18.1	17.1	15.4	16.9	16.2	18.4	15.4	17.3	3.8	15.6	18.3	17.8	14.7	16.6	16.9	28.0
	STATION DISCHARGE PRESSURE (PSIG)	1260.0	1260.0	1260.0	1260.0	1257.9	1246.8	1260.0	1256.7	1259.1	1254.1	1229.2	1202.4	1234.7	1260.0	1223.7	1213.3	1217.4	1165.1
	STATION DISCHARGE TEMPERATURE ("F)	30.0	31.4	31.4	31.7	31.5	30.5	31.3	31.5	31.8	31.0	30.9	31.3	31.9	32.0	32.0	31.4	31.1	28.0
	COMPRESSION RATIO		1.266	1.186	1.186	1.191	1.169	1.184	1.179	1.242	1.243	1.249	1.254	1.254	1.254	1.244	1.243	1.242	
	HORSEPOWER REQUIRED		24493	20518	20459	20781	18585	20028	19743	26070	26471	26776	27416	27504	27245	25949	26091	25880	
z	HORSEPOWER SPARE		3167	6752	6191	4029	6155	7052	7217	480	1039	174	194	46	25	421	49	30	
12	HORSEPOWER INSTALLED-SITE RATED		27660	27270	26650	24810	24740	27080	26960	26550	27510	26950	27610	27550	27270	26370	26140	25910	
ES	NO. OF UNITS INSTALLED		1	I I	1	1	1	_	<u> </u> !	1	1	1				1	1		
A d	STANDARD ISO RATING OF UNITS		26500	26500	26500	26500	26500	26500	26500	26500	26500	26500	26500	26500	26500	26500	26500	26500	
CO	COMPRESSOR SUCTION PRESSURE (PSIG)		1035.9	1071.5	1070.8	1064.6	1075.4	1073.1	1074.5	1021.8	1016.4	991.3	966.2	962.3	1012.0	991.0	983.4	988.1	
	COMPRESSOR SUCTION TEMPERATURE (°F)		13.5	17.1	16.0	14.3	15.9	15.2	17.3	14.3	16.2	12.7	14.5	17.3	16.8	13.6	15.5	15.8	
	COMPRESSOR DISCHARGE PRESSURE (PSIG)		1273.0	1273.1	1273.	1270.9	1259.8	1273.1	1269.7	1272.1	1267.1	1242.2	1215.4	1247.7	1273.0	1236.7	1226.3	1230.4	
	COMPRESSOR DISCHARGE TEMPERATURE("F)		39.8	39.1	38.0	36.8	36.0	36.8	38.6	42.4	44.6	41.6	44.1	46.9	46.3	42.0	43.9	44.1	
5	COOLING LOAD (TONS)		3443	3122	2538	2074	2172	2164	2856	4323	5562	4333	5056	5986	5793	3927	4921	5152	
RI	REFRIGERATION HORSEPOWER REQUIRED		877	793	636	524	553	552	722	1076	1373	1078	1290	477	1428	963	1250	1269	
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EXHIBIT G-II

FLOW DIAGRAM DATA

1.0 DESIGN DATA

Hydraulic studies have been performed using a thermalhydraulic steady state gas flow computer program. This program uses the energy, momentum and continuity equations for determining gas conditions along the length of the pipeline. In addition, the program calculates the compressor and refrigeration loads at each station. A description of the program is found in Exhibit Z-9.0.

The Alaska Segment of the ANGTS includes seven compressor stations spaced along the pipeline from Prudhoe Bay to the Alaska-Yukon border. The stations are located along the pipeline in such a manner as to balance compressor horsepower and refrigeration loads at each station as closely as possible, while considering the constraints imposed by environmental, site accessibility, soil and other related factors. The system will be expanded to sixteen compressor stations in the future in order to handle a larger quantity of gas flow. The future compressor stations will have the same equipment rating as the initial seven stations. The design basis for the system is provided in Exhibit Z-9.0.

The pipeline generally consists of 48-inch O.D. x 0.60-inch minimum wall thickness pipe with metallurgy applicable to arctic conditions. Detailed data for the pipeline material specifications are found in Exhibit Z-9.1.

Each station consists of a single centrifugal compressor driven by a 20,000-30,000 horsepower gas turbine, a 9,000 ton nominal capacity refrigeration system capable of maintaining the gas between 0° and 32°F, and on-site electric power generation and ancillary facilities necessary for operation and maintenance. Detailed data for the stations is provided in Exhibit Z-9.2.

EXHIBIT H

TOTAL GAS SUPPLY DATA

1.0 RESERVES AND DELIVERABILITY

Applicant will be a natural gas transporter, and as such will not buy or sell natural gas. Substantial gas reserve and deliverability evidence was analyzed as part of the initial proceeding in Docket No. CP76-96, <u>et al</u>. This evidence was reviewed by the Federal Power Commission in its Recommendations to the President on May 1, 1977, wherein it concluded that:

"The Prudhoe Bay Field contains the largest accumulation of oil and gas ever discovered on the North American Continent. The in-place gas volumes in the field is in excess of 40 Tcf. Estimates of the portion of the in-place gas that can be ultimately recovered range up to 75-80 percent. Gas can be made available for sale from the Prudhoe Bay Field at a rate of at least 2.0 Bcfd and possibly slightly more than 2.5 Bcfd." (III-23)

The FPC analysis was supplemented by the Report of the Working Group on Supply, Demand and Energy Policy Impacts of Alaska Gas to the President on July 1, 1977, which provided similar supply substantiation.

The President similarly concluded that Alaska gas would make a significant contribution to the national natural gas supply and would assist in replacing imported oil. The President stated in his Decision and Report to Congress on the Alaska Natural Gas Transportation System, September, 1977, that:

"Proved saleable gas reserves of 20.6 to 22.8 trillion cubic feet (tcf) in the Main Pool accumulation in the Prudhoe Bay Field represent more than a full year of natural gas consumption at the current consumption rate of about 17.5 tcf per year. Prudhoe Bay production of 2.4 bcfd of gas will include production from other reservoirs which have been identified in the field, the Kuparuk and the Lisburne. Production at that rate would increase domestic gas production by approximately 5 percent in the years when Alaska gas first

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1.0 Reserves and Deliverability (Continued)

becomes available. Additional gas discoveries in the North Slope, or in other areas of Alaska through which the pipeline passes, would increase potential deliverability even further.

"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 0.8 tcf per year (2.4 bcfd) might be produced.

"Under the best of circumstances -- which assume the most optimistic supply projections, demand reductions and fuel substitutions -the addition of Alaska gas to domestic production will make a substantial contribution toward closing the gap between natural gas supply and demand. Such additional gas supplies could allow some industries with special processes to continue burning natural gas longer, and allow more residential use of natural gas, further displacing oil imports." (pp. 89-90)

The Commission reviewed the President's conclusions in comments on the <u>Decision</u> in October, 1977. The Commission found that, based on information then available, the estimated gas-in-place is 40.4 tcf to 42.8 tcf, and that based upon shrinkage and reasonable recovery efficiency the recoverable reserves are approximately 25 tcf.

The Commission also referenced Conservation Order Number 145, issued by the Division of Oil and Gas Conservation, Department of Natural Resources, State of Alaska on June 1, 1977. This order provides that the raw gas production rate of 2.7 bcfd is consistent with sound conservation practice based upon currently available data. The order also states that "after field and local fuel requirements and the removal of carbon dioxide and liquids from the produced gas, it is estimated that a gas production rate of 2.7 billion standard cubic feet per day will yield 2.0 billion standard cubic feet of pipeline quality gas." This order is the latest official action of the State of Alaska regarding the permissible production rate from Prudhoe Bay. However, the Division of Oil and Gas Conservation held hearings on May 7 and 8, 1980 concerning the producers' proposed waterflooding operations. The producers' proposal was based upon the assumption of gas sales commencing in later 1985 or early 1986 at 2.0 bcf a day for a period of 30 years consistent with Conservation Order Number 145.

1.0 Reserves and Deliverability (Continued)

The Commission issued an order on August 6, 1979 which established the diameter and pressure for the Alaska Segment. In this order the Commission found that there was no new information as to the amount of gas that is expected to be available for transportation through the pipeline nor any other information that would call for a different conclusion about the required capacity of the pipeline from that stated in the President's <u>Decision</u>. The Commission then ordered that the compressor station size and spacing be established for an initial capacity of 2.0 to 2.4 bcfd.

Consistent with all of the above findings, Applicant has designed for an inital capacity of 2.0 bcfd that can be expanded through the addition of compressor stations up to a capacity of 3.2 bcfd.

2.0 GAS SUPPLY COMMITMENTS

Nine natural gas companies have gas purchase contracts or letters of commitment from the three major producers in the Prudhoe Bay field that represent approximately 85 percent of the available gas. Six of the nine purchasing companies are members or affiliates of members of the Alaskan Partnership. Table 2-1 of this exhibit shows an estimate of the reserves and deliverability based upon these commitments.

The reserves and deliverability are estimates only because the producer ownership of the Prudhoe Bay unit varies as between the associated gas and the gas cap, as shown in Table 2-2. Therefore, it is not possible to determine with precision the share of gas that has been dedicated to each particular buyer. Applicant has prepared the estimates in Table 2-1 based on discussions with certain buyers and producers.

Based upon these volumes, Applicant is continuing to plan that approximately 70 percent of the Alaskan gas will be delivered at Monchy, Saskatchewan for customers receiving gas from the Eastern Leg and approximately 30 percent at Kingsgate, British Columbia, for customers receiving gas from the Western Leg.

TABLE 2-1

PRUDHOE BAY RESERVES AND DELIVERABILITY APPROXIMATE PRESENT ALLOCATION

	Reserves (Tcf)	Plant Outlet Daily Average (Bcfd)	Percent
Producers			
Arco Exxon Sohio State of Alaska Other Producers	8.20 8.20 5.70 3.25 .65	. 63 . 63 . 44 . 25 . 05	31.5% 31.5 22.0 12.5 2.5
	26.00	2.00	100.0%
Buyers:			
Exxon -			
PG&E Northern Natural Michigan-Wisconsin	2.74 2.73 2.73	.21 .21 .21	33.3% 33.3 _ <u>33.4</u>
	8.20	.63	100.0%
Arco-			
Pacific Lighting Panhandle Eastern Texas Eastern (east) Transwestern (west) Texas Gas Trans- mission United Gas	2.71 1.64 .82 .82	.21 .13 .06 .06	33.3% 20.0 10.0 10.0
	.98 _1.23	.08	12.0 15.0
	8.20	.63	100.0%
Sohio-			
Northern Natural Columbia Gas System	1.90 <u>3.80</u>	.15 .29	33.3% 66.7
	5.70	.44	100.0%

TABLE 2-2

OIL RIM AND GAS CAP PARTICIPATING AREAS

	Oil Rim	Gas Cap	
	Owner's Area	Owner's Area	
Working	Participation,	Participation,	
Interest 1	Percent	Percent	
Sohio	52.9641874	14.5927467	
Arco	20.3821959	42.2421202	
Exxon	20.3821959	42.2421202	
Mobil	2.0834237	.2696516	
Phillips	2.0348696	.2554977	
Chevron	.8394716	.3978636	
Amerada Hess	.5379095		
Getty	.5484119		
LL&E	.0397586		
Marathon	.0499035		
Placid	.0423514		
N.B. Hunt	.0290722		
Hunt Ind.	.0178279		
Caroline Hunt Tr.	.0161403		
Wm. Hubert Hunt Tr.	.0161403		
Lamar Hunt Tr. Est.	.0161403		

¹ LEGEND:

Amerada Hess - Amerada Hess Corporation Arco - Atlantic Richfield Company Chevron - Chevron U.S.A., Inc. Exxon - Exxon Corporation Getty - Getty Oil Company Hunt Ind. - Hunt Industries N.B. Hunt Caroline Hunt Tr. - Caroline Hunt Trust Estate Lamar Hunt Tr. Est - Lamar Hunt Trust Estate Wm. Herbert Hunt Tr. - William Herbert Hunt Trust Estate LL&E - The Louisiana Land and Exploration Company Marathon - Marathon Oil Company Phillips - Phillips Petroleum Company Mobil - Mobil Oil Corporation Placid - Placid Oil Company Sohio - Sohio Petroleum Company

SOURCE: Exhibit 26A of the Prudhoe Bay Unit Operating Agreement Effective 1/1/79

EXHIBIT I

MARKET DATA

Alaskan Northwest Natural Gas Transportation Company ("Applicant") will be performing transportation service for various Shippers of Alaskan Gas. Each Shipper of Alaskan Gas in accordance with Section 157.14 (a) (11), Title 18, C.F.R., as applicable, will be submitting the necessary market information relative to their service areas. Applicant intends to submit market data from an overall world energy perspective, in conjunction with Exhibit L (Financing), which is to be submitted as a supplemental exhibit subsequent to the filing date of the instant application.

EXHIBIT J

CONVERSION TO NATURAL GAS

Applicant will be a transporter of natural gas for shippers which contract to purchase gas from producers in the supply areas served by Applicant's proposed pipeline. As a transporter of gas, Applicant will neither purchase nor sell gas and thus no conversions to natural gas from other fuels are proposed by reason of this application.

Applicant anticipates that the shippers which will have purchased gas and contracted with Applicant for the transportation thereof, will file with the Commission, applications for facilities for the transportation and/or sale of such gas and that such applications will provide information to the Commission relating to the requirements of Section 157.14, Exhibit J.

2+

EXHIBIT L

FINANCING

Alaskan Northwest Natural Gas Transportation Company ("Applicant") is presently engaged in ongoing negotiations with Producers, State of Alaska and the Department of Energy relative to the Producers' and the State of Alaska's participation in the financing of the Alaska Segment of the ANGTS. Applicant will have to await the conclusion of such negotiations before Applicant can successfully complete its financial plan.

1

3.

EXHIBIT M

CONSTRUCTION, OPERATION AND MANAGEMENT

ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

ALASKA SEGMENT OF THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM

PREFACE TO EXHIBIT M

This Exhibit contains the Northwest Alaskan Pipeline Company (NWA) Management Plan (Section 1 through Section 6, inclusive). The overall management framework and principals have been approved by the office of the Federal Inspector. This Exhibit also contains the Alaska Highway Pipeline Project Operating Agreement (Section 7), and the Project Management Contractor (PMC) Organization (Section 8).

1. RESPONSIBILITIES OF THE ALASKAN NORTHWEST PARTNERSHIP ¹

A representative of each of the member partners has been designated to sit on the Board of Partners of Alaskan Northwest. The responsibilities of the Board of Partners are analagous to that of a corporate board of directors and, as such, include establishment of all major governing policies throughout the life of the Project, including overall fiduciary responsibility for the Project itself and for each of the member companies. The Board of Partners has established three committees: an executive committee which develops project policies; an audit committee which establishes guidelines for conducting audits, and reviews the results of audits; and a compensation committee which assists in establishing compensation policies for the operating partner, Northwest Alaskan.

Included among the specific responsibilities of the Board of Partners are: establishment of the initial design of the pipeline and future expansions; establishment of design, construction and operating budgets; execution of interim and permanent financing agreements; establishment of partnership tax policies; selection and retention of outside consultants, including the Project Management Contractor; admission of additional partners; the filing of Partnership tariffs and any amendments thereto; approval of the final budgeted cost of the project; approval of additional qualified expenditures; and establishment of partnership distributions.

¹ By its order of June 30, 1978, the Commission approved the Partnership Agreement. On February 6, 1980, the Partnership filed for Commission approval of the amendment to the Partnership Agreement.

PREFACE TO EXHIBIT M (Continued)

2. RESPONSIBILITIES OF THE OPERATING PARTNER

The Board of Partners has designated Northwest Alaskan as the operating partner. In this capacity Northwest Alaskan will maintain direct control over the construction and operation of the Alaska Segment, and will be responsible for implementing the Board of Partners' policies regarding the design, construction, and operation of this Segment. Among the specific responsibilities of Northwest Alaskan, as set forth in the Partnership Operating Agreement executed on October 1, 1979 by all member partners, are: the preparation and filing of all applications and reports to all governmental agencies, both state and federal, for the construction and operation of the Alaska Segment; the purchase of all materials, equipment, and supplies necessary for the design, construction, and operation of the pipeline, except as delegated to the Project Management Contractor; the purchase and acquisition of all rights-of-way, land in fee, and permits necessary for the construction, operation, and maintenance of the pipeline; the providing of management, supervisory, operating, and maintenance services, administrative liaison, and related services to the Partnership, including legal, accounting, engineering, planning, technical services, tax services, and regulatory matters; and the providing of an adequate number of qualified supervisory, professional, and craft personnel to perform the obligations contemplated above.

While Northwest Alaskan will rely on a Project Management Contractor (PMC) to manage detailed engineering, design, procurement, and construction tasks, Northwest itself will approve and monitor all PMC policies and procedures to ensure that the Board of Partners' policies are properly implemented, and will retain responsibility over project quality control procedures, including the monitoring and implementing of such procedures.

² While approval of the Project Management Plan is a matter under the purview of the Federal Inspector, it is submitted herewith in Exhibit M, for information purposes.

PREFACE TO EXHIBIT M (Continued)

In its capacity as operator, Northwest Alaskan has established specific policies with respect to both design and construction activities. First, outside expertise will be used where required to develop detailed designs. The use of experienced specialty contractors will ensure the highest quality designs. Second, a staged design concept will be utilized for the project. Under this approach permanent facilities have been divided into four independent major design elements - pipeline and civil, compressor and metering stations, operation and maintenance facilities, and supervisory control and communication systems. A final design, design cost estimate, and detailed construction schedule for each of these elements will be completed and submitted separately to the Federal Inspector for approval in the sequence dictated by the overall work schedule. Third, studies have been and will be conducted, including field and laboratory tests, where necessary, to confirm the parameters used in a design, and final pipeline integrity will be tested hydrostatically by methods and procedures which will be submitted to the Federal Inspector for approval.

The specific construction policies include the use of fixed price contracts for all major construction activity, as required by Condition I of the President's <u>Decision and</u> <u>Report</u>; ³ the use of execution contractors, each of whom will control its own support services, including labor, equipment, safety, security, transportation, administration, and training; a decentralized approach to construction decision-making; the use of a "corridor concept" whereby existing facilities and support services are utilized to the maximum extent practicable; and, the use of three construction seasons to complete the project, which will provide adequate time for construction and testing and permit Applicant to fully address environmental concerns.

³ To ensure that the cost advantages of fixed price contracts are realized, Northwest Alaskan will be certain that adequate engineering is completed for each bid package before bids are requested.

PREFACE TO EXHIBIT M (Continued)

3. RESPONSIBILITIES OF THE PROJECT MANAGEMENT CONTRACTOR (PMC)

After an extensive analysis of other major projects, including those requiring arctic construction, the Board of Partners decided to engage a Project Management Contractor (PMC) to be responsible for all design and construction activity on behalf of the Partnership. The use of a PMC was dictated in part by the organizational advantages of such an approach, including the ability of a PMC to increase or reduce the number of craft and technical employees dedicated to the project as requirements dictate, and the ability of a PMC to build a nucleus of experienced managers dedicated solely to this single project.

On April 17, 1978, Applicant selected Fluor Engineers and Constructors, Inc. of Irvine, California as the Project Management Contractor. Fluor was chosen over other engineering and consulting firms because of its experience in dealing with projects of this size, ⁴ its pipeline engineering and design capabilities, its project cost and schedule control experience, its arctic experience, and its past performance regarding quality assurance and control programs.

Fluor, as PMC, will be responsible for performing or causing to be performed the design and engineering for the pipeline and the compressor and metering stations, including the establishment of environmental control standards; will establish estimating and scheduling procedures for project

⁴ Fluor's other major projects have included the engineering and design of the Alyeska pump stations and terminal, the SASOL South Africa coal liquefaction complex, the Berri, Saudi Arabia gas treatment center, a 2 Bcf per day gas treating plant in Ender, Germany, the Namhae Chemical Corporation fertilizer complex in the Republic of Korea, a petrochemical complex at Al Jubail, Saudi Arabia and a natural gas conservation project in Saudi Arabia which includes gas gathering, treating and transmission facilities. The combined capital costs of these projects exceed 11 billion dollars.

PREFACE TO EXHIBIT M (Continued)

control; will establish procurement procedures and a materials and supply plan; will develop quality control plans and will assist Northwest Alaskan in preparation of quality assurance programs; will administer construction contracts and act as agents for Applicant in awarding contracts; will act as the construction manager and establish labor and camp control plans; will manage field construction activity; and, will provide for a communications network, both system and project wide. ⁵

⁵ To perform certain of the above functions, Northwest Alaskan has retained a number of engineering firms under the PMC's management who specialize in arctic engineering. A joint venture consisting of Michael Baker, Jr., Inc. and Gulf Interstate Engineering Company, both experienced in pipeline design, engineering studies and cost estimation in arctic regions, will be responsible under the PMC's management for the pipeline and civil design. Northern Technical Services is providing professional services in the areas of arctic engineering and hydrological sciences. This expertise manifests itself in permafrost engineering, arctic engineering, ice physics, and river and groundwater hydrology and hydraulics. R&M Consultants, Inc. is providing geotechnical support in the area of route soil conditions. R&M experience has been in the specific area of soil analysis for the Alyeska project and borehole drilling program.

VOLUME I

EXHIBIT M

CONSTRUCTION, OPERATION, AND MANAGEMENT

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CONSTRUCTION, OPERATION AND MANAGEMENT

1.0 INTRODUCTION

The Alaska Natural Gas Transportation System (ANGTS) is a 4,800 mile pipeline system which will bring natural gas from Alaska's North Slope through Alaska and Canada for delivery to markets in the midwestern and western United States. In November 1977, the President of the United States issued a Decision and Report to Congress, selecting Alaskan Northwest Natural Gas Transportation Company* as the successful applicant to design and construct the system. As sponsor of the project, Alaskan Northwest Natural Gas Transportation Company is responsible for the Alaska Segment of the transportation system; other companies have assumed responsibility for the facilities to be built in Canada and the lower 48 states.

Included in the "President's Decision," Section 5, I.1, was the following requirement: "Prior to the issuance of the certificate, the successful applicant shall provide a detailed overall management plan, to be approved by the Federal Inspector, for the preconstruction and the construction phases of the transportation system project." It is in response to this requirement that this management plan is submitted. The plan describes the project organization that has been developed, and outlines the policies that have been established for each management area.

This management plan focuses on the preconstruction and construction phases of the project. These phases will ultimately be followed by the operations phase and termination of the system. Detailed plans for those phases will be developed in subsequent documents.

Alaskan Northwest Natural Gas Transportation Company has been formed by seven gas pipeline transmission companies. Those companies have designated Northwest Alaskan Pipeline Company (NWA) as the operating partner. This management plan describes how these companies will manage the project through the operating partner. It also describes how the activities of contractors will be directed. Although many

^{*}Alaskan Northwest Natural Gas Transportation Company has been assigned the rights of Alcan Pipeline Company, which was the corporate name that was used in the President's Decision.

1.0 INTRODUCTION (Continued)

of the contractors that will ultimately work on the project have not yet been selected, in the near future, when they are engaged, they will be managed according to the policies outlined in this plan.

This management plan is primarily an internal document for the companies involved in the project. As such, it will be expanded and revised when necessary to aid the effective management of the project. While it has been compiled at this time to meet government requirements, its primary purpose is to support the effective management of the project.

This document integrates the more specialized plans of specific functional staffs. As such, it presents an overall perspective on the management of the project, and does not contain the degree of detail that is available in the more specialized supporting plans.

Finally, this management plan is a document which will evolve as the project progresses. While the fundamental management concepts which have been established will not change, more detailed procedures will evolve with the project. Management plan revisions and subsequent related documents will be made available to the Federal Inspector as they are developed.

1.1 EXECUTIVE SUMMARY - MANAGEMENT PLAN FOR THE DESIGN AND CONSTRUCTION OF THE ALASKA GAS PIPELINE

This executive summary provides a brief overview of how the Alaska gas pipeline project will be managed. Corresponding to the body of the report, the summary is organized into five sections:

- o Project description.
- o Organization.
- o Approach to government interface.
- o Project management requirements.
- o Project control and reporting.

This plan describes the guiding policies which have been established for each area.

Additional detail is contained in the specialized plans prepared by specific functional staffs. These plans include the Engineering Plan, Design Manual, Project Controls Plan,

1.1 EXECUTIVE SUMMARY - MANAGEMENT PLAN FOR THE DESIGN AND CONSTRUCTION OF THE ALASKA GAS PIPELINE (Continued)

Construction and Logistics Plan, Operating and Maintenance Plan, Socioeconomic Plan, Quality Plan, Procurement Plan, and Environmental Plan.

1.2 PROJECT DESCRIPTION

The Alaska Natural Gas Transportation System will extend south from Prudhoe Bay, through Alaska and Canada, to the United States Midwest and West Coast markets. This plan deals only with the management of the Alaska Segment of the System (which extends from Prudhoe Bay on the North Slope of Alaska to the Alaska/Yukon border).

Natural gas will be delivered to the origin of the system in Prudhoe Bay. The gas will then be transported south along a route which parallels the Trans Alaska Pipeline System (TAPS) to Delta Junction. From that point the pipeline will proceed in a southeastern direction, along the Alaskan highway to the Canadian border.

The pipeline design and construction will take six years, with gas flow scheduled to begin in mid-1985. The project will have three phases: (1) preconstruction; (2) construction; and (3) operation. During the preconstruction phase, the system will be designed and support facilities prepared. The project is currently in this phase, which will continue through 1982. The ensuing construction phase will be a period of intense activity on pipeline spreads and compressor station work sites, spanning the period from 1983 to mid-1985. Finally, the operation phase will begin when gas packing commences in 1985.

1.3 ORGANIZATION

Three organizational principles have been established that define the roles and responsibilities of the owners, the operating partner, and the contractors:

<u>Owner/partner responsibilities</u> - The Board of Partners will set major policies throughout the project.

Operating Partner management and control - Northwest Alaskan Pipeline Company (NWA) will implement the policies set by the Board of Partners and will direct the activities of the Project Management Contractor (PMC).

1.3 ORGANIZATION (Continued)

<u>Contractor participation</u> - Experienced contractors will be used for design and construction tasks. These will include a PMC, which will be responsible for managing all design and construction activity; execution contractors (ECs), which will construct sections of the pipeline and compressor stations; and other specialized contractors and consultants.

1.3.1 Owner Organization and Role

The Alaskan Northwest Natural Gas Transportation Company, a partnership, has been formed by the following companies:

- Northern Arctic Gas Company, a Delaware corporation, a wholly owned subsidiary of <u>Northern Natural Gas</u> Company.
- Northwest Alaskan Pipeline Company, a Delaware corporation, a wholly owned subsidiary of <u>Northwest</u> <u>Energy Company</u>.
- Pan Alaskan Gas Company, a Delaware corporation, a wholly owned subsidiary of <u>Panhandle Eastern Pipe</u> Line Co.
- Calaska Energy Company, a California corporation, a wholly owned subsidiary of <u>Pacific Gas and Electric</u> <u>Company</u>.
- Pacific Interstate Transmission Company (Arctic), a California corporation, a wholly owned subsidiary of Pacific Interstate Transmission Company.
- United Alaska Fuels Corporation, a Delaware corporation, a wholly owned subsidiary of <u>United Gas Pipe</u> <u>Line Company</u>.
- American Natural Alaskan Company, a corporation, a wholly owned subsidiary of <u>American Natural Resources</u> <u>Company</u>.

Northwest Energy Company has formed a subsidiary, Northwest Alaskan Pipeline Company, to manage their role in the project. The Alaskan Northwest Natural Gas Transportation Company has been designated by the President of the United States and ratified by Congress to construct and operate the Alaska Segment of the Alaska Natural Gas Transportation System. The partner companies have designated NWA as the operating partner, and have formed a Board of Partners which reviews project policies and guides NWA on policy issues.

1.3.1 Owner Organization and Role (Continued)

The Chairman of the Board of Partners is also the Chairman and Chief Executive Officer of NWA. The partner companies will work through three committees:

- o The Executive Committee will develop project policies.
- o <u>The Audit Committee</u> will establish guidelines for audits and will review audit results.
- o <u>The Compensation Committee</u> will establish compensation policies for the operating partner organization.

1.3.2 NWA Organization

NWA will have a small staff in the following functional areas to implement the policies set by the partners and to direct and oversee the activities of the PMC:

Environmental Programs Public Relations Administration Finance Engineering and Construction Regulatory and Governmental Affairs Legal Quality Assurance Internal Audit Alaskan Operations

1.3.3 Contractor Organizations

NWA will engage a project management contractor (PMC) which will, in turn, engage execution contractors, design contractors, and other specialty contractors. The PMC will establish staffs to manage the activities of all contractors. They will include staffs for the following areas:

Project controls Quality compliance Contracts administration Project engineering Procurement Information systems Finance Construction management

ECs and other contractors will establish organizations to fit their specific needs.

1.4 APPROACH TO GOVERNMENT INTERFACE

Government agencies will need to work with the project organization on numerous issues. NWA recognizes that working effectively with the government is critical to the project. For that reason, NWA will retain direct responsibility for interfacing with government agencies. NWA will help these agencies to fulfill their objectives, and will also be responsible for acquiring all necessary government permits and approvals. These responsibilities have been assigned to three separate NWA staffs: (1) the Regulatory and Governmental Affairs staff; (2) the Alaskan Operations staff; and (3) the Engineering and Construction staff.

The Regulatory and Governmental Affairs staff will have overall responsibility for coordinating the Northwest Alaskan interface with governmental agencies. It will also be a principal point of contact for the Office of the Federal Inspector (OFI), and have responsibility for satisfying requirements imposed by the OFI, to include obtaining Notices-To-Proceed. The Regulatory and Governmental Affairs staff will maintain personnel in Washington, D.C., as well as in Alaska and wherever else they are needed to maintain an effective liaison with government agencies.

The Alaskan Operations staff's government interface will be for the purpose of acquiring permits. This staff will determine permit requirements and will work with the Government and other NWA staffs to establish effective procedures for processing permits.

The Engineering and Construction staff will interface with the government on technical issues, and will ensure compliance with permits on work sites. Engineering and Construction personnel will coordinate their government liaison activities closely with the Regulatory and Governmental Affairs staff and the Alaskan Operations staff to ensure a consistent approach.

1.5 PROJECT MANAGEMENT REQUIREMENTS

NWA has established policies in several areas of major concern to project management. These policies will be used to establish more detailed plans and procedures; they address requirements in the following areas:

- o Environment
- o Permits and approvals

1.5 PROJECT MANAGEMENT REQUIREMENTS (Continued)

- o Design
- o Purchasing and material management
- o Records management
- o Quality program
- o Communications
- o Construction and logistics
- o Labor relations
- o Support services
- o Contracts
- o Socioeconomic affairs

1.5.1 Environment

Protection of the environment is a critical consideration which will affect every other aspect of project management. NWA is conducting programs to collect environmental data with respect to designs, scheduling, and construction methods. This will be centralized into an Environmental Master Guide, which will provide site-specific information to organizations involved in project planning, construction, operation, and maintenance. In addition, an environmental plan is being developed to integrate the operational details of construction with the need for environmental protection.

1.5.2 Permits and Approvals

The majority of the Alaska Segment will cross federal or state-owned lands, and thus a number of permits will be required from many different agencies for preconstruction and construction activities. The NWA Alaskan Operations staff will have overall responsibility for obtaining projectrelated permits, and will provide these to contractors. NWA will aid other organizations in preparing supporting documentation, and will develop a schedule for meeting permit requirements which will be integrated with project construction schedules.

1.5.3 Design

NWA's policies will ensure that the final design of the Alaska Segment is reliable and economical. NWA and the PMC will coordinate all contractors and support functions involved in the design, and will work closely with the government during the required review process. NWA is emphasizing the use of outside design expertise, which will be used, whenever required, to develop detailed designs. Further, the design will be broken down into stages, and the project grouped into the following four independent design elements:

1.5.3 Design (Continued)

- o Pipeline and civil
- o Compressor and metering stations
- o Operation and maintenance facilities
- o Supervisory control and communications facilities

To a large extent, each of these will be treated as a distinct element of the project. The PMC will engage specialty contractors, as required, to design the various elements, and will direct and coordinate their efforts.

1.5.4 Purchasing and Material Management

Purchasing and material management responsibilities will be delegated to the PMC. The PMC will perform all procurement, expediting, inspection, and traffic functions, and will be responsible for documentation of these activities. NWA will direct and monitor the PMC's activities by establishing policies, approving key decisions, and making spot checks of the PMC's performance.

1.5.5 Records Management

Automated storage and retrieval, governed by project record policies, will be used to control project records. These policies will be administered by NWA and implemented by the PMC. They will apply to all contractors, the PMC, and NWA. The policies will set minimum requirements for record quality and submission schedules, and will control format, storage, retention, and retrieval.

1.5.6 Quality Program

Quality Assurance will be the ultimate check on project quality. As such, it will be a responsibility retained by NWA. NWA will approve all project quality procedures and will monitor and audit the implementation of these procedures.

The PMC will be responsible for quality control and inspection throughout the project. It will develop and implement project quality procedures, subject to NWA approvals. The PMC will specify vendor and contractor quality control requirements, and provide continuous inspection during construction.

1.5.7 Communications

The PMC will have the responsibility for providing an effective communications network. Systems will be installed according to NWA specifications, and their use will be coordinated by the PMC. Existing systems and facilities such as those owned by Alyeska or a common carrier, will be used whenever practical. When construction is complete, systems will be adapted for NWA use during operation of the pipeline.

1.5.8 Construction and Logistics

Policies for construction and logistics are based on three concepts. First, fixed price contracts will be used for all major construction activity. Second, as much authority and responsibility as is practical will be delegated to the field level. This will permit quick decisions by NWA or the PMC to allow the ECs to maintain progress. Finally, ECs will control as much of their operation and support as is practical. NWA will supply only those materials which involve critical quality considerations or services which would be uneconomically duplicated if supplied by each contractor.

1.5.9 Labor Relations

NWA will allow independent contractors to have primary control over the labor resources needed to accomplish their work. NWA will also encourage the negotiation of project-wide labor agreements, to be administered by the ECs for their own craft employees. This will give contractors necessary control, while providing a consistent set of labor rates, jurisdictions, grievance procedures, and work rules.

1.5.10 Support Services

ECs will control their own support services. These services will include catering, safety, security, insurance, training, supply of arctic clothing, and transportation. The ECs will also provide certain services, such as catering and lodging for non-EC personnel (e.g., NWA, PMC, and government personnel) at an agreed-upon rate. These requirements will be clearly specified in their contracts so that support costs can be included in their bids. The emphasis is placed on EC self-sufficiency to encourage ECs to accurately project and manage their support costs.

1.5.11 Contracting

NWA has adopted a fixed price approach to contracting. Firm fixed price contracts will be used whenever possible. The scope of work will be defined in enough detail to permit contractors to estimate their costs and risks, and submit competitive bids. If there are uncertainties regarding the scope of work, firm fixed price contracts will be used for that portion of the work which is defined and other types of contracts (e.g., fixed unit price contracts) will be used for the remainder.

1.5.12 Socioeconomic Affairs

Many of NWA's activities will have an impact on the social and economic well-being of the State of Alaska, its cities, communities, and citizens. Native communities and local life-styles along the pipeline right-of-way will be affected. NWA is working to maximize the positive socioeconomic effects of this project. Activities that will adversely affect the social and economic stability of an area will be counterbalanced by those that improve or restore socioeconomic equilibrium. NWA has established a Socioeconomic Affairs staff to work with government agencies and local groups on socioeconomic issues. NWA will provide timely information on project activities to local groups.

1.6 PROJECT CONTROL AND REPORTING

The systems established for project control and reporting will satisfy two major goals. First, data must be gathered to permit the management control of costs and schedules. Second, data must also be collected for FERC and tax reporting requirements, as well as for preparation of financial reports for the partnership and other investors. These goals are distinguished as:

Cost and schedule control Financial control

1.6.1 Cost and Schedule Control

To support the goal of cost and schedule control, the project will be broken down into work packages which will constitute the fundamental units for purposes of work authorization, planning, scheduling, cost estimating, and performance monitoring. Cost and schedule progress data will be collected by the PMC from other contractors. Requirements to submit

1.6.1 Cost and Schedule Control (Continued)

specific types of cost and schedule data will be incorporated in requests for quotations and subsequent contracts. The PMC will manage the field collection of this data, and NWA will monitor and audit the data collection process to verify accuracy. Cost and progress data will be submitted in enough detail to support quick and equitable negotiation of changes in scope, should these become necessary.

1.6.2 Financial Control

The data collection systems that provide information for cost and schedule control also provide inputs for financial, FERC, and tax reporting. These reports require both cost and progress information. Costs will be aggregated based on the FERC's Uniform Code of Accounts. The initial input of cost and progress data will be coded in enough detail to derive information for both control and accounting purposes. Contractual relationships with the PMC and ECs will define the requirements for submitting these data, which will be collected by the PMC.

2.0 PROJECT DESCRIPTION

The Alaska Segment of the Alaska Natural Gas Transportation System (ANGTS) extends from Prudhoe Bay to the Alaska/Yukon border. This section of the management plan briefly describes the pipeline system and presents an overview of the project approach.

2.1 SYSTEM DESCRIPTION

The ANGTS is an overland pipeline system that will transport natural gas from the Prudhoe Bay area of Northern Alaska (on the Arctic Ocean) through Alaska and Canada into the Midwestern and Western sections of the contiguous United States (see Figure M-1, at the end of this section).

Alaskan Northwest Natural Gas Transportation Company is responsible for the design, construction, operation, and maintenance of the 743-mile segment of the line that will extend from Prudhoe Bay to the Alaska/Yukon border.

A consortium of Canadian firms will manage engineering and construction for the portion of the line which extends through Canada from the Alaskan border to the Idaho and Montana international boundaries. Other U.S. firms will be responsible for installation of the two segments of the system located in the lower 48 states.

The pipeline system is to be designed for an initial average volume of 2.0 to 2.4 billion cubic feet per day from the Prudhoe Bay field, with 70 percent of the gas dedicated for delivery to the Midwest, and 30 percent to the West Coast markets. The portion of the pipeline system from Prudhoe Bay to Whitehorse, Yukon Territory, will be 48 inches in The portion from Whitehorse to James River Junction diameter. will be 56 inches in diameter - the diameter is increased to accommodate production from gas fields in the Beaufort Sea and MacKenzie Valley delta. The system will split into the Eastern and Western legs near the James River Junction. From this point, deliveries will be made to the Midwest through Northern Border's 42-inch diameter pipeline, and deliveries to the West Coast will be made through the Pacific Gas Transmission Company and Pacific Gas and Electric Company systems. (These latter facilities will be expanded to handle the increased volumes, terminating in the San Francisco Bay area of California.)

2.1 SYSTEM DESCRIPTION (Continued)

The Alaska Segment, Figure M-2, will consist of approximately 743 miles of 48-inch diameter pipeline with seven compressor stations. Metering stations will be located at the purchase location in Prudhoe Bay, and at the Alaska/Yukon border. Mainline connections will be installed near Fairbanks, Delta, Tok, and other locations, so that metering and regulating stations can be built to deliver gas to those areas, if desired. The pipeline system will be designed so that throughput can be increased by installation of additional compressor stations (shown in Figure M-2). Block valves will be installed at intervals of no greater than 20 miles to permit the isolation of potential problems requiring system shutdown.

Pipeline quality natural gas will be delivered to the origin of the system at 1260 psig and 24°F. Since the Alaska Segment will be built in areas containing continuous and discontinuous permafrost, the pipeline will be operated in a chilled state (below 32°F) to prevent soil degradation. Gas chilling will be accomplished by refrigeration at each of the compressor stations. A pressure of 1260 psig will be maintained throughout the Alaskan portion of the system. A centralized Operations Control Center (OCC), located in Fairbanks, will monitor and control the Segment operations.

Existing transportation corridors are being used throughout the length of the system, including the Alaska and Canadian Segments and the Eastern and Western legs. The route of the Alaska Segment parallels the existing Prudhoe Bay haul road and Trans Alaska Pipeline System (TAPS) facilities from the Prudhoe Bay fields south to Delta Junction near Fairbanks. After this point, it departs from the TAPS route and proceeds in a southeastern direction, along the Alaskan Highway to the Canadian boundary.

2.2 PROJECT PHASES

The Alaska Gas Pipeline project will have three phases, as described below.

The preconstruction phase includes all activities prior to the commencement of construction of the pipeline and compressor stations. Activities during this period will include design, activation of cost and schedule control systems, acquisition of regulatory approvals and permits, engagement of execution contractors, and preparation of facilities for the construction phase, including restoration

2.2 PROJECT PHASES (Continued)

of work camps. During this phase, NWA Engineering and Construction personnel and Project Management Contractor (PMC) personnel will be located in Irvine, California; Alaska; and Houston, Texas. The number of NWA and PMC personnel will gradually increase throughout this phase to support the increasing level of design and field activity. Near the end of this phase, a substantial amount of work will be underway on communications systems, logistical facilities, and camps in preparation for the construction phase.

The <u>construction phase</u> will begin when construction activity commences on the permanent pipeline facilities and compressor stations, and will end when the system is completed and tested. At the beginning of this phase, much of the NWA Engineering and Construction organization and the PMC's staff will move to Alaska to direct operations from Fairbanks. This phase will be characterized by intensive construction activity during the summer months. As the end of the construction phase approaches, the number of personnel involved will be reduced as major elements of the system are completed. At that time, NWA startup and operations crews will increase their staffing and take control of the system.

The <u>operations phase</u> will commence after the pipeline and compressor stations have been tested and approved for operation. Central control of pipeline operations will be maintained in Fairbanks, Alaska. An emergency team with fabrication and shop support will be located in Fairbanks. Warehouse facilities, spare parts, and equipment storage will be located along the pipeline route in Alaska to support scheduled and emergency maintenance activities. Preventive and regular annual maintenance will be scheduled by the Operations organization and carried out by NWA personnel and contract services.

Administrative and technical support for the operations activities will be located in Fairbanks, and will provide necessary personnel, contract administration, gas measurement, engineering, and local accounting functions for pipeline operations.

This Management Plan presents the approach adopted for the preconstruction and construction phases of the project.

2.3 PROJECT TIMING

Figure M-3 presents a simplified schedule of major project milestones.

The schedule in Figure M-3 shows the FERC filing in June 1980 with certification and unencumbered right-of-ways becoming available in early 1981. Major equipment contracts will be awarded in early 1981, also. The fabrication and testing of this equipment will take more than three years, and the final items of major equipment will be on station in late 1984.

The schedule for pipeline and station construction also covers several years. Final design of pipeline spreads and stations will be complete in early 1982. EC bids will be evaluated and contracts will be awarded in late 1982. In early 1983, these contractors will start civil and crossing work on pipeline spreads and station site preparation. Actual spread construction will begin in late 1983, and station construction will begin in early 1984. Mechanical completion of the pipeline and stations will occur in late 1985, and it will be followed by approximately two months of gas packing. After gas packing is complete, gas flow will begin.



FIGURE M-1



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MAY. 1980

3.2 OWNER ORGANIZATION AND ROLE (Continued)

- Calaska Energy Company, a California Corporation, a wholly owned subsidiary of <u>Pacific Gas and Electric</u> <u>Company</u>.
- Pacific Interstate Transmission Company (Arctic), a California Corporation, a wholly owned subsidiary of Pacific Interstate Transmission Company.
- United Alaska Fuels Corporation, a Delaware Corporation, a wholly owned subsidiary of <u>United Gas Pipeline</u> <u>Company</u>.
- American Natural Alaskan Company, a Corporation, a wholly owned subsidiary of <u>American Natural Resources</u> Company.

This partnership has been assigned the rights of Alcan Pipeline Company, designated by the President of the United States and ratified by Congress, to construct and operate the Alaska Segment of the Alaska Natural Gas Transportation System. A representative of each of the partner companies sits on the Board of Partners. The Board of Partners operates in a manner similar to a corporate board of directors. It reviews project policies, and through the Executive Committee, guides the operating partner (NWA) on policy issues. The operating partner is responsible for implementing policies concerning design, construction, operation, and maintenance of the pipeline. The equity capital at risk in the project will be provided largely by the partners, who will continue to be responsible to their shareholders for maintaining control over the investment. Therefore, the Partner Board will have approval authority over a number of specific activities designated in the Partnership Agreement. As listed in the Agreement, these include:

- o Establishing the initial design of the pipeline and future expansions.
- o Establishing the annual construction and operating budgets for the project.
- o Executing interim and permanent financing agreements and commitments.
- o Establishing partnership tax policies.
- o Selecting depositories for partnership funds.

3.2 OWNER ORGANIZATION AND ROLE (Continued)

- o Selecting and retaining the project management contractor.
- o Selecting and retaining a certified public accountant.
- o Admitting additional partners.
- o Transferring a partner's interest in the partnership.
- Filing of the Partnership's Tariffs, or any amendment thereof, with FERC.
- Changing the authority and responsibility delegated in the Partnership Agreement by any committee, to the operating partner, or to the PMC.
- o Approving the final budgeted cost of the project.
- o Identifying and evaluating qualified expenditures.
- o Requesting additional capital contributions.
- o Determining amounts and timing of distributions to partners.

The Board of Partners will work with NWA's Chief Executive Officer through three committees:

The Executive Committee consists of one representative from each partner company. The Committee will meet at least monthly and will report to the Board of Partners on major items of policy. In addition, the Executive Committee will make certain decisions for the Board as specified in the Partnership Agreement.

The Audit Committee consists of representatives of six of the partners, excluding Northwest Energy. It will work with internal and external auditors to establish guidelines for conducting audits and to review the results of audits. It will meet at least quarterly, and will report to and be directed by the Board of Partners.

The Compensation Committee consists of members to be designated by the Board of Partners. This Committee will assist in establishing compensation policies for the operating partner organization. In addition, it will provide informed yet objective guidance for the project organization in setting senior management compensation.

3.2 OWNER ORGANIZATION AND ROLE (Continued)

The owners will retain ultimate authority over the project, will monitor progress and work with NWA's Chairman in establishing major policies. The Board of Partners will carry out this role without duplicating the day-to-day management function delegated to the operating partner.

3.3 NWA ORGANIZATION

NWA, as the designated operating partner, will have the personnel and the organization to ensure that the entire project is designed, constructed, and operated according to the policies of the partnership and in the partnership's and the consumer's best interests. NWA will rely on the PMC to manage detailed engineering, procurement, and construction tasks; NWA itself will provide overall policy guidance, direction, and overview, implementing the major policies established by the Board of Partners. In addition, NWA will provide financing and liaison with the Government and with the consortiums managing other segments of the pipeline system.

Figure M-4 shows the structure of NWA's senior management; the NWA President reports to the Office of the Chairman. The Quality Assurance staff and Audit staff report directly to the Office of the Chairman. The other NWA staffs, each headed by a vice president, report to the NWA President. The responsibilities of each of these individuals and staffs are described in this section.

The basic structure of the NWA organization will remain the same in the preconstruction and construction phases of the project. However, staffing levels and locations of staffs will change and evolve as the project progresses.

The size of the NWA organization will be small relative to the total number of personnel employed on the project. NWA currently has 86 exempt employees. The staffing level will be increased gradually throughout the preconstruction phase as project activity increases. Staffing will reach a peak during the construction phase when NWA will have approximately 300 exempt employees.

<u>NWA will locate personnel</u> wherever they are required. Currently NWA personnel are assigned as shown on Table 1. During the preconstruction phase, elements of the Engineering and Construction organization will move from Irvine, California

TABLE 1

Location of NWA Exempt Personnel 1st Quarter 1980

Location	Number	Staff Represented
Salt Lake City, Utah	40	Administration, Finance, General Counsel, Public Relations, Segment Coordination, Engineering and Construction, Internal Audit
Irvine, California	a 24	Engineering and Construction, Environmental Programs, Internal Audit, Regulatory and Governmental Affairs
Alaska	15	Alaska Operations, Engineering and Construction, General Counsel, Regulatory and Governmental Affairs
Washington	7	Finance, Regulatory and Governmenta Affairs

3.3 NWA ORGANIZATION (Continued)

to Fairbanks, Alaska. Construction Management and Cost and Schedule Control staffs will move in late 1981. Most of the Engineering staff will move in early 1982, although some NWA engineering personnel will remain in California and Texas where the major design contractors are headquartered. During the construction phase, most NWA personnel will be located in Fairbanks, Alaska. Exceptions will be the Finance staff in Salt Lake City and members of the Regulatory and Governmental staff in Washington, D.C.; both of these staffs will also have representatives in Fairbanks.

The following sections describe the responsibilities of NWA senior managers and their staffs. While each staff has a specific set of responsibilities, several staffs will work jointly on many aspects of the project. An example of how NWA staffs will coordinate their efforts can be seen in NWA's approach to interfacing with other segments of the pipeline system. Three staffs will be extensively involved in this task, and several other staffs will be involved to a lesser extent. The Engineering and Construction staff, through that staff's Vice President of Segment Coordination, will interface with other segments on technical matters. The Regulatory and Governmental Affairs staff will interface on issues involving regulation; and the Financial staff will coordinate project financing. These staffs will work together to achieve an effective interface with other segments. They will coordinate their own activities and involve other NWA staffs when appropriate.

Many other aspects of the project will be managed through joint action by several NWA staffs. Staffs will be comprised of personnel with broad experiences in their respective areas who will work as a team to direct the full range of project activities.

3.3.1 Office of the Chairman

The Office of the Chairman consists of the Chairman and Chief Executive Officer of NWA as well as the Vice Chairman. The Chairman of the Board of Partners is the Chairman and Chief Executive Officer of NWA. He has ultimate authority for implementing the policies of the Board of Partners, and is concerned with those decisions which are reserved for the Board of Partners by the Partnership Agreement.

3.3.1 Office of the Chairman (Continued)

The Office of the Chairman is also the official liaison between the Board and NWA (except for audit information). It calls upon various NWA managers to periodically report to the Board, and will ensure that Board policies are communicated to appropriate NWA staffs in the most efficient manner.

The Office of the Chairman is also involved in the approval of major policies, schedules, forecasts, and total project budget. The office approves the selection of design and execution contractors, the selection of vendors for major procurements (e.g., mainline pipe). Major scope changes and design changes in the project also require the approval of this office.

Within the Office of the Chairman, the senior executive reporting to the Chairman is the Vice Chairman. The Vice Chairman assists the Chairman in directing the NWA organization and has been delegated decision-making authority for many day-to-day activities. The Vice Chairman provides the NWA President and Vice Presidents with a readily available source of guidance on policies established by the Board of Partners and the NWA Chairman.

3.3.2 President

The President is responsible to the Office of the Chairman for directing the day-to-day project activities, and is primarily concerned with the internal management of NWA functional staffs. In this capacity the President directs the implementation of project policies.

As shown in Figure M-4, seven senior managers report directly to the President. The President directs and coordinates the activities of these managers and through them and their staffs supervises the ongoing management of the project. The President will ensure that effective working relationships are established among these staffs. As an example, the Vice President, Environmental Programs and Senior Vice President, Engineering and Construction, must work together to incorporate environmental concerns in pipeline designs. Additionally, the President will ensure that the Northwest Alaskan Vice Presidents establish appropriate interfaces with PMC personnel and government officials. The Assistant to the President provides support in special areas designated by the President.

3.3.3 Quality Assurance

The Quality Assurance (QA) function will be headed by the Director of Quality Assurance, who reports directly to the Office of the Chairman, as shown in Figures M-4 and M-5. The director will be responsible for day-to-day management of NWA's QA programs, as described in the Quality Assurance subsection of the Project Management Requirements, Section 5.0. This function will have two primary responsibilities.

The first is to assist the PMC in establishing project-wide quality control (QC) procedures; the QA function will retain final approval for these procedures. Procedures will be established during the preconstruction phase and will require a small staff of specialists.

The QA staff's second responsibility will be to establish and carry out QA procedures during all phases of the project. This responsibility extends to both vendor and on-site construction activities. The size of the QA staff will be increased as the project moves into the construction phase to provide QA coverage for the expanding range of project activities. Each construction spread will have a full-time QA engineer assigned to provide day-to-day quality monitoring of the PMC's QC activities. This QA engineer will report within the quality assurance organization, and will provide liaison between the field organization and centralized QA organization.

A more detailed description of the QA function is contained in the Quality Plan.

3.3.4 Internal Audit

The Internal Audit function provides the Board of Partners with an in-house capability for auditing all project activities. The Director of Internal Audit, shown in Figure M-5, will receive direction from the Office of the Chairman. Regular reports and reviews will be presented both to the Office of the Chairman and to the Board of Partner's Audit Committee. The Committee may require the Director of Internal Audit to perform specific audits and to report the results directly to its members.

There are two major internal audit activities: (1) formulating audit plans and procedures, and (2) performing audits and reporting on results. Once audit plans and procedures have been developed, the Audit Committee will approve them,

3.3.4 Internal Audit (Continued)

and will then review and approve the regular audit schedules on an annual basis. The audit group will carry out audits at all levels of the organization. The Director of Internal Audit will monitor the corrective activity and report progress to the Audit Committee.

3.3.5 Public Relations

The Vice President of Public Relations will be responsible for providing the services necessary for NWA to communicate to all external groups including the press, public, and investors. The communications effort will include use of press releases, publications, and speeches.

Figure M-6 shows the elements of the Public Relations staff. The specific responsibilities of the Public Relations function include:

Develop projects and programs to communicate the company's positions and policies to the media, government, business, and financial community, employees, partners, stockholders (when applicable), suppliers, customers, industry, and the public at large.

Process requests for information from the press and general public, and coordinate pooling of information with other U.S. and Canadian participants.

Stay abreast of the opinions, proposals, recommendations, and developments reported in the media and elsewhere relating to the company and its activities, and disseminate this information internally.

Develop, prepare, publish, and distribute internal and external publications or other materials (e.g., photographs, films, slides, tapes, and advertising).

Contract for services of public relations consultants; approve and direct all communications activities carried out by these consultants.

Authorize, prior to release, all press statements, publications, speeches, and papers or other materials presenting or implying a corporate position to external audiences, to ensure accuracy of statements.

3.3.5 Public Relations (Continued)

Develop working relationships with representatives of local and national media (e.g., press, radio, television, trade and technical publications) and coordinate appearances by company personnel before media, industry groups, business, financial and civic organizations.

3.3.6 Administration

The Vice President of Administration has five major areas of responsibility, as summarized in Figure M-7 and described below.

Employee relations - The Director of Employee Relations has responsibility for managing the employment, security, medical, and safety requirements for NWA employees. In addition, the Employee Relations staff will monitor employee relations for contractors involved in the project. NWA will not be a party to any labor agreements or a participant in any grievance procedures. However, the Director of Employee Relations will maintain familiarity with the practices of all project organizations, and will work with the PMC to resolve problems where necessary.

Affirmative action - The Manager of Affirmative Action Programs reporting to the Vice President of Administration, ensures that requirements concerning affirmative action are fulfilled. This manager is responsible for both internal compliance within the NWA organization and for programs associated with organizations external to NWA, such as the PMC and ECs. Programs with an external focus will require extensive coordination with government personnel, the PMC, and other contractors to set goals, impose requirements on contractors, and monitor EC compliance.

The Manager of Affirmative Action Programs will have a relatively small staff. This staff will establish policies and interface with government personnel involved in this area. The PMC will operate the data-collection system and monitor EC performance in this area.

The NWA Affirmative Action staff's first major activity will be to negotiate employment and procurement goals and timetables with representatives of the Office of the Federal Inspector for each phase of the project. The Affirmative Action staff will then incorporate the requirements to develop Affirmative Action plans into Requests for Quotations. The ability of contractors to meet Affirmative Action requirements will be a factor of consideration when evaluating contractor bids.

3.3.6 Administration (Continued)

After contracts are established, the Affirmative Action staff will direct the PMC in monitoring contractor employment and procurement practices. Contractors will prepare Affirmative Action plans demonstrating how they will meet objectives. And, they will submit periodic reports through the PMC indicating their progress toward Affirmative Action goals.

NWA will consolidate contractor reports and submit them to the OFI. NWA will work with the OFI and other appropriate agencies to identify difficulties in meeting goals and to provide assistance when appropriate. One type of assistance which NWA will provide will be to help contractors identify and use government programs. NWA will work with federal and state agencies to determine how available government programs can be used to help contractors with training, hiring outreach, counseling, and other aspects of Affirmative Action programs.

<u>General Services</u> - The Director of General Services has responsibility for providing the NWA organization with necessary office facilities, mail service, secretarial services, office equipment, automobiles and aircraft, office supplies, and administrative policies and procedures. This staff will provide services for NWA offices at all locations.

Management Information Services (MIS) - The Director of MIS, reporting to the Vice President of Administration, has responsibility for development and maintenance of information systems for the project. In accomplishing this, the Director has primary responsibility for ensuring the compatability of information systems used on the project. This Director provides policy guidance on MIS matters to the PMC and monitors PMC activities in this area. The Director of MIS also serves as a technical resource for other NWA staffs, and will have a limited staff consisting of personnel experienced in all aspects of system development and operations. The MIS staff will work with other NWA staffs to define MIS requirements and to direct and manage the PMC and other organizations engaged to develop and operate systems.

The MIS staff integrates all user needs by preparing an overall NWA MIS plan. This plan will identify all NWA information needs; it will outline how systems will be provided to satisfy those needs, and the plan will describe the computer equipment which will be used on the project. The project will utilize computer equipment at PMC facilities

3.3.6 Administration (Continued)

in California and Texas, at the Northwest Alaskan Pipeline Company Headquarters in Salt Lake City, Utah, and at Fairbanks facilities and field locations in Alaska. The Director of MIS will recommend to NWA senior management the types of hardware and software to be used and will develop procedures for accommodating user systems on the hardware network. The Director of MIS works with PMC MIS personnel to analyze software and hardware alternatives and to ensure that NWA MIS systems are integrated, where appropriate, with PMC systems.

The MIS staff works with other NWA staffs to determine the scope, format, and timeliness of their information needs. After requirements are defined, the MIS and information user staffs jointly determine how requirements are to be met. The MIS staff and information user staffs will form task forces to jointly manage each system implementation effort.

NWA will not develop major new systems for the project. Rather, existing systems will be adapted so that the time and expense required to put systems into operation are minimized. Also, NWA will not build an extensive systems development staff. Rather, the MIS staff will work to define the major characteristics of systems. Outside organizations such as the PMC, owner company staffs, and consultants will be engaged to adapt systems and put them into operation. In cases where the PMC is providing systems, the NWA user and MIS staffs will provide policy guidance to the PMC and monitor PMC activities. In cases where systems from owner companies and other contractors are being adapted for use by NWA, the user and MIS staffs will jointly manage the activities of the groups engaged to implement the systems.

Detailed provisions for operating computer equipment will be outlined in the MIS plan. NWA will initially use the PMC and owner company staffs to operate equipment. As the construction phase is completed, the MIS staff will work with the operations staff to train NWA personnel to assume operating control of permanent systems.

<u>Security</u> - The NWA Manager of Security will ensure that security is provided for equipment, supplies, facilities, and for the completed transportation system. Security services will be managed by contractors for their respective facilities and by the PMC for centralized project facilities. NWA's Manager of Security will not directly manage security for the project but rather will establish policies, interface with government law enforcement officials, direct PMC activities, and monitor project-wide security activities.

3.3.6 Administration (Continued)

The Administration staff is headquartered in Salt Lake City for the preconstruction phase. That headquarters will be transferred to Fairbanks, Alaska for the construction phase. Throughout the project, Administration staff personnel will be located wherever they are required to provide services to the NWA organization.

3.3.7 Finance

The NWA Finance function will be headed by the Vice-President, Finance, who will have two areas of responsibility, as shown on Figure M-8 - the Treasurer and Controller functions. The Controller is responsible for NWA accounting, internal financial controls, financial reporting, tax reporting, FERC reporting, and financial audit interface. The Controller's staff will obtain project expenditure data and will prepare periodic financial reports reflecting financial performance for the entire project. Data will be obtained from the PMC and from the NWA Cost and Schedule Controls group and other NWA staffs. Information Systems will provide for coding in adequate detail for all accounting purposes, as described in Section 6.0 of this document. The Controller's staff will work with the MIS staff to develop financial control systems for preconstruction and construction phases, as well as for pipeline operations.

Internal financial controls will be established by the Controller to ensure that IRS, FERC, and accepted financial and accounting procedures are followed. Financial, tax, and FERC reporting requirements will be met by means of the financial control systems described below in Section 6.

Procedures will also ensure that financial activities are carried out in an appropriate manner, without conflicts of interest and with adequate safeguards.

The Controller will interface with the Office of the Federal Inspector, FERC, and independent financial auditors to assist in their reviews of operations, and will maintain records to allow audits to be performed.

The Treasurer manages and maintains custody of funds and other financial assets of the corporation and the partnership, and supervises the banking, credit, financial planning and insurance functions. The Treasurer plans and directs the activities of the Treasury staff, and maintains direct relationships with outside advisors and debt and equity participants, as necessary, to implement the partnership's financing plan.

3.3.7 Finance (Continued)

The Treasury staff schedules, coordinates, and controls the preparation of corporate and partnership budgets and forecasts. After budgets are approved by management, the Treasury staff develops comparisons of budgeted and forecasted figures to actual results for management review and action.

This staff is also responsible for proper endorsement of company and partnership checks, notes, bonds, mortgages, and other documents as authorized by the Board of Partners. In addition, the staff supervises the following financial activities:

Establishment of working and depository accounts in appropriate banks.

Periodic reviews of the financial condition of all company banks.

Management of policies and procedures regarding credit and collection.

Maintenance of adequate and suitable insurance or self-insurance covering all corporate property and potential liabilities.

Maintenance of proper bond, shareholder, partner and dividend records.

Studies of business, financial, and economic conditions as they relate to the operations or policies of the company.

3.3.8 Regulatory and Governmental Affairs

The Regulatory and Governmental Affairs staff has primary responsibility for interfacing with Federal Government agencies and for negotiating major agreements with the government. These will include the Tariff, Stipulations, FERC Certificate, Department of Interior Grant of Right-of-Way, and other major approvals required for the project. The Vice President, Regulatory and Governmental Affairs, will act as NWA's principal liaison with the Federal Inspector and senior agency officials.

Figure M-9 shows the two directors reporting to the Vice President, Regulatory and Governmental Affairs, and lists their major areas of responsibility. The responsibilities
3.3.8 Regulatory and Governmental Affairs (Continued)

of the Regulatory and Governmental Affairs staff are described in more detail in Section 4.0, "Approach to Government Interface."

3.3.9 Legal

As shown in Figure M-10, the General Counsel has responsibility for representing NWA in legal matters and providing legal input to all other NWA staffs. The General Counsel will approve all NWA contracts and major contracts between the PMC and other contractors (i.e., execution contracts) to ensure that NWA legal considerations are adequately incorporated. Outside legal firms will be used when appropriate, and the legal staff will direct the activities of those firms.

3.3.10 Alaskan Operations

The Vice-President of Alaskan Operations is responsible for maintaining the NWA headquarters and liaison office in Alaska. As shown in Figure M-11, this includes responsibility for managing socioeconomic affairs, for acquiring land-use rights, and for obtaining permits from agencies in Alaska. The responsibilities of the Alaskan Operations Office for permit acquisition are described in Section 4.0. In short, this staff will interface with permitting authorities in Alaska to fulfill government requirements. In so doing, they will coordinate closely with other NWA staffs. The Vice-President of Alaskan Operations will be familiar with all NWA activities in Alaska and will coordinate with other staff heads to orchestrate those activities. This Vice-President will provide a liaison for individuals and groups in Alaska that need to interface with the project. This is expected to include the legislature, state commissions, business organizations, corporations, and many other parties.

3.3.11 Environmental Programs

The Vice-President of Environmental Programs ensures that project policies meet environmental stipulations with respect to design, scheduling, and execution of work. As shown in Figure M-12, the Vice-President will advise the NWA President on environmental matters, coordinate with the NWA Engineering and Construction personnel concerning environmental impacts associated with design and construction, and coordinate NWA's work with government personnel involved in environmental matters.

3.3.11 Environmental Programs (Continued)

Environmental staff personnel reporting to the Vice-President of Environmental Programs will be located with the PMC in Irvine, California and in Alaska to provide the PMC direction relating to the work on environmental aspects of the project. These personnel will be located on construction sites as members of NWA's team of personnel assigned to spread and station field locations during the construction phase. The field staff will ensure that contractors adhere to the environmental provisions of permits during construction. The field staff will ensure that contractors adhere to the environmental provisions of permits during construction. Specific environmental programs are described in more detail in the Environmental Plan.

3.3.12 Project Engineering and Construction

The Senior Vice-President, Engineering and Construction, has responsibility for directing and monitoring the day-to-day planning, engineering, construction, testing, and certification activities of the PMC. This group will work closely with the other NWA staffs, coordinating policies with those staffs and depending on them for support. The responsibilities of this group are described below and the organization is displayed in Figure M-13.

3.3.12.1 Segment Coordination - The Vice-President, Segment Coordination, interfaces with other segments of the ANGTS, and is NWA's representative to the Canadian and Northern Border companies on technical and operating matters. The segment coordinator will keep the Senior Vice-President, Project Engineering and Construction and other NWA officers informed on the technical and scheduling status of other segments and ensure that information regarding purchasing of potentially scarce goods and services is coordinated among segments.

<u>3.3.12.2</u> Cost and Schedule Control - The Director of Cost and Schedule Control will direct and monitor the PMC in five areas as shown in Figure M-14 and described below:

<u>Cost engineering</u> is responsible for reporting and analysis of budget and cost forecast information for use by NWA managers in the Engineering and Construction organization and in other NWA departments.

Estimating verifies the accuracy of PMC cost estimates and ensures that PMC cost estimates for original work packages and changes are made according to approved procedures.

3.3.12.2 Cost and Schedule Control (Continued)

<u>Planning and scheduling</u> directs the PMC in preparing schedules and reporting progress, and ensures that NWA policies and procedures are followed.

<u>Field program control</u> directs and monitors reporting activities in the field to ensure that NWA policies and procedures are followed. Cost and schedule control engineers from this group will be assigned as members of NWA's field teams to direct the PMC's operation of control systems and collection of data.

<u>Project cost administration</u> reviews PMC direct invoices for contractual compliance, oversees the accumulation of costs for project control purposes, and ensures that contractors document their costs as required.

Additional information on cost and schedule control is contained in the Project Controls Plan.

<u>3.3.12.3</u> Construction and Logistics - The Vice-President of Construction and Logistics is responsible for directing and monitoring the PMC's activities in field construction and supporting logistics. Throughout the project, field teams from the Construction and Logistics group will oversee activities on work sites.

During the preconstruction phase, the Director of Field Programs, reporting to the Vice-President of Construction and Logistics, will be located in Alaska to oversee field activities. This director will assign NWA field engineers to monitor contractor field work associated with drilling programs, surveys, field testing, and preparation of facilities. These personnel will ensure that quality is maintained, enforce the terms of contracts, and ensure compliance with permit stipulations. The Director of Field Programs will coordinate with the Vice-President of Alaskan Operations to identify permits required for field programs.

During the construction phase, the entire Construction and Engineering group will be located in Alaska. As shown in Figure M-15, the Vice-President of Construction and Logistics will have two Division Managers, who in turn have Area Managers for each pipeline section and its associated compressor stations. Each Area Manager will have a Pipeline Manager plus one Station Manager for each compressor station. Pipeline Managers will supervise NWA field teams located at pipeline work sites. Station Managers will supervise work at compressor stations. NWA field teams will include some

3.3.12.3 Construction and Logistics (Continued)

personnel temporarily assigned from other NWA staffs and other personnel permanently assigned to field teams. The composition of teams will be tailored to provide the skills required at each site. Figure M-16 shows a typical field team comprised of a Welding Engineer and an Engineering Supervisor reporting directly to the NWA Pipeline Manager. In addition, an Environmental Engineer and a Cost and Schedule Control Engineer will be assigned from their respective staffs to the field team. These latter two engineers and any other personnel assigned to the team will closely coordinate their activities with the appropriate Pipeline and Station Managers.

NWA field teams will have authority to make decisions regarding many problems encountered at work sites. Whenever possible, NWA field teams will provide the decisions required to expedite work. When issues arise which exceed their decision-making authority, the NWA field teams will notify the appropriate NWA personnel and work with them to resolve problems as quickly as possible. NWA field teams will be involved in resolving the following types of issues.

<u>Permits</u> - Field teams will expedite acquisition of permits. When permits which have not been previously anticipated are required to prevent work delays, NWA field teams will work with government field people and NWA permit personnel to prevent delays.

<u>Material</u> - Field teams will work to prevent delays due to unavailability of owner supplied materials. When major components such as valves and pipe are required to allow work to continue as scheduled, NWA field teams will expedite delivery of the required items. They will work with the PMC and NWA Logistics personnel to identify critical items and coordinate delivery.

Design changes - When conditions are experienced in the field which require changes in designs, NWA field people will work to determine what changes are required, approve changes, or arrange for approvals to be obtained. Execution contractors and the PMC will have authority to make certain types of design changes. When the changes required exceed the authority of EC's and the PMC, NWA field personnel will review the recommendations and provide direction on how to proceed. When the changes required exceed the approval authority of NWA field teams, they will work with NWA management to make the necessary decisions. In all cases NWA construction management will be informed of changes.

3.3.12.3 Construction and Logistics (Continued)

<u>Contract scope changes</u> - When conditions are encountered which require modifying the scope of EC contracts, NWA field teams will work to define the change. This will involve working with the PMC to determine why a change is required and to determine the extent of the impact on the EC.

<u>Verification of control data</u> - Members of the NWA Cost and Schedule Control staff will monitor the collection of control data to ensure accuracy. They will assist in interpreting control information and in collecting additional data when required.

A more detailed description of the NWA field organization and responsibilities is contained in the Construction and Logistics Plan. PMC field procedures are described in the PMC Management Plan.

The Logistics Manager reports to the Vice-President of Construction and Logistics and maintains an overview of the PMC's Logistics group. This manager will develop policies for material movement from procurement locations to construction sites and directs the PMC's implementation of new logistics policies or procedures.

<u>3.3.12.4</u> Engineering - The Vice-President of Engineering, as shown in Figure M-17, has four managers to provide engineering direction in the areas of pipeline, stations, civil/ geotechnical, and controls and communication system engineering. These Engineering Managers will direct and monitor the PMC and design contractors throughout the design process. They will approve design concepts (e.g., gas composition, route, types of control systems), assist in the development of design criteria and help resolve problems. They will review and approve designs using the detailed project engineering procedures. In addition, they will monitor the development of field design manuals, which will provide guidelines and procedures for field engineers to aid in addressing unexpected conditions encountered in the field.

NWA's Engineering staff will also review and approve material lists and specifications for system components and materials. In some cases they will participate in bid analysis and vendor selection by reviewing PMC recommendations. They will coordinate extensively with PMC personnel and with the NWA Quality Assurance staff. In addition, the engineering

3.3.12.4 Engineering (Continued)

organization will coordinate extensively with the Environmental Programs group to ensure that designs, schedules, and methods incorporate the appropriate environmental considerations.

3.3.12.5 Materials Management - The Director of Materials Management will direct the PMC's procurement activity. The Director will review and approve the PMC's purchasing procedures, monitor activities, and direct corrective action where necessary. The Director will also review data submitted to the Project Controls staff on material-related costs and schedules and direct corrective action when appropriate.

3.3.12.6 Contract Administration - The Manager of Contract Administration will oversee and direct the PMC in contract preparation and administration. This manager will ensure that the PMC performs the contract preparation, bidding, selection, and compliance monitoring in accordance with NWA requirements. The manager will also give policy direction to the PMC in the area of contracts, and under the direction of NWA management, will resolve contract compliance problems.

3.3.12.7 Startup and Operations - The Director of System Startup and Operations will be responsible for planning for the operation of the pipeline. During the preconstruction and construction phases this planning will encompass two general areas: (1) advising the Engineering and Construction personnel on operating requirements, and (2) developing and training an organization to take operating control of the pipeline when construction is complete.

The objective of advising Engineering and Construction personnel is to ensure that the pipeline system can be efficiently and safely operated. The director will work with engineering personnel to develop designs which satisfy operating requirements. During construction this director will work with NWA Construction Management personnel to ensure that the construction methods used are consistent with operating requirements.

During the construction phase, the Director of System Startup and Operations will develop detailed plans for assuming operating control of the pipeline. Training and testing programs will be developed and operating personnel will be identified so that a complete operating organization will be prepared to startup and operate the pipeline.

A more complete description of the operations phase is contained in the Operating and Maintenance Plan.

3.4 CONTRACTOR ORGANIZATIONS

The PMC, ECs, design contractors, and other specialized contractors will each establish organizations which fit their respective responsibilities and internal operating procedures.

3.5 PMC ORGANIZATION AND INTERFACE WITH NWA

3.5.1 PMC Organization

Figures M-18 and M-19 depict the PMC organization. As indicated on those exhibits, there will not be a corresponding PMC staff for each of NWA's staffs. Rather, the PMC will organize to fulfill its unique responsibilities. A more detailed description of contractor organizations, responsibilities, and projected staffing levels is contained in the Construction and Logistics Plan. Figure M-20 indicates some of the key interface points between NWA and the PMC. Interface is not limited to the points shown on that figure. All NWA managers will work, to some extent, with PMC managers during the project. In many cases a particular NWA manager will work with several PMC managers. This flexible relationship between NWA and PMC personnel will allow a small number of NWA managers to provide policy guidance for all of the PMC's activities.

Additional information on the specific relationships between NWA staffs and PMC staffs is contained in the NWA Interface Manual.

3.5.2 EC Organization

Figure M-18 displays the conceptual relationship between ECs, the PMC, and NWA. As shown, the PMC directs the activities of ECs. The detailed relationship between the PMC and ECs will be established by fixed price contracts. These contracts, when established, will specify the EC's specific responsibilities, scope of work, reporting responsibilities, etc. Figure M-21 shows a typical EC organization and the PMC management plan will provide more information on how ECs will be managed.

SENIOR MANAGEMENT ORGANIZATION STRUCTURE



QUALITY ASSURANCE AND INTERNAL AUDIT ORGANIZATION



- Contractor & Subcontractor Performance and Controls
- Other Areas as Required

PUBLIC RELATIONS ORGANIZATION



- Produce Publications
- Issue News Releases
- Ensure Effective Flow of NWA Information to Government Personnel and the Public

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ADMINISTRATION ORGANIZATION



FINANCE ORGANIZATION



– Financial Management

-

REGULATORY AND GOVERNMENTAL AFFAIRS ORGANIZATION



- Represents NWA before FERC
- Prepares Exhibits for Hearings
- Coordinates with OFI and Government Agencies

- and Government Agencies

 Negotiates Government Stipulations
- and Right-of-Way Agreements

 Advises on Relations with Government
- and Special GroupsMaintains Contacts with Government
- Maintains Contacts with Government Officials
- Distributes Government Supplied
 Information

LEGAL ORGANIZATION

Vice President, General Counsel and Corporate Secretary

- Engages and Supervises Outside Law Firms
- Provides Legal Input to Regulatory Agreements
- Counsels on Negotiation of Contracts of all Types
- Determines Legal Sufficiency of Contracts

ALASKAN OPERATIONS ORGANIZATION



- Identifies Permits Required From Government Agencies
- Coordinates Development of Permit Applications
- Submits Applications to Agencies

ENVIRONMENTAL PROGRAMS ORGANIZATION

ENVIRONMENTAL PROGRAMS Vice President

- Advises NWA President on environmental considerations
- Provides direction to PMC on environmental matters
- Supervises field environmental personnel
- Generates and promulgates, environmental data

.

ENGINEERING AND CONSTRUCTION ORGANIZATION





CONSTRUCTION AND LOGISTICS ORGANIZATION





TYPICAL DIVISION CONSTRUCTION ORGANIZATION

* - North or South Division Manager as shown in Figure M-15

- NOTE: Dotted lines indicate extensive coordination
 - NWA Quality Assurance Engineers will also be located at work sites
 - NWA field teams may be modified to include temporary assignment of additional NWA personnel from other staffs as required

ENGINEERING ORGANIZATION



NOTE: Dotted lines indicate extensive coordination

MAJOR PROJECT PARTICIPANTS



PROJECT MANAGEMENT CONTRACTOR



KEY INTERFACES BETWEEN NORTHWEST ALASKAN AND THE PMC

This chart indicates major interface points, however, interface points are not limited to the areas indicated. Northwest Alaskan managers will work closely with all PMC personnel as required.

3

Northwest Alaskan Personnel	Subject of Interface	PMC Personnel
Chairman and Vice Chairman	Long-term major policies	Project Director
President	Key decisions concerning full range of project management	Project Director
Senior Vice President, Engineering and Construction	Engineering and construc- tion management decisions	Project Director
Vice President, Environmental Programs	Environmental considerations	Manager, Environmental Engineering
Vice President, Alaskan Operations	Coordination with Alaskan government and business entities	Alaskan Operations/ Construction
Vice President, Con- struction & Logistics	Management of execution contractors	Director, Project Operations Engineering
Vice President, Engineering	Management of engineering contractors	Engineering Manager
Director, Cost and Schedule Control	Formulation and analysis of project control information	Project Control Manager
Director, Material Management	Procurement and logistics	Project Procurement Manager
Director, Contracts Administration	Formulation and manage- ment of contracts	Contracts Administration Manager
Director, Management Information Systems	Development and manage- ment of information systems	Information Systems Manager
Director, Quality Assurance	Quality control	Quality Compliance Manager

TYPICAL EXECUTION CONTRACTOR



• Equipment acquisition

* -- The organization shown may differ slightly for each execution contractor engaged

** - Execution contractors are expected to be joint ventures formed by major construction firms; they will rely on their parent organizations for key people and specialized services

4.0 APPROACH TO GOVERNMENT INTERFACE

Government agencies will monitor and review many aspects of the project. Because of the importance and complexity of this government involvement, NWA will retain direct responsibility for coordination with government agencies. Although contractors may prepare materials for submission to government agencies, NWA will review and approve the documents and make the actual submissions. NWA's policies will support the following objectives.

- o Ensure compliance with the "President's Decision," as well as with state and federal stipulations, statutes, and regulations.
- Ensure that all authorizations are obtained, including the FERC Certificate of Public Convenience and Necessity, construction and operation permits, DOI Right-Of-Way, and authorizations to proceed.
- o Accomplish the above in a timely and cost-effective manner.

NWA personnel will establish close working relationships with their counterparts in government agencies. To perform the necessary coordination in the most expeditious manner, all NWA staffs will be involved to some extent in coordinating with government agencies. The involvement of the Regulatory and Governmental, Alaskan Operations, and the Construction and Engineering staffs will be particularly complex. Following is a description of how those staffs will interface with government agencies.

4.1 REGULATORY AND GOVERNMENTAL AFFAIRS

The Regulatory and Governmental Affairs staff will have overall responsibility for coordinating the NWA interface with government agencies. This staff will establish and maintain effective working relationships with key personnel in government agencies, they will identify requirements for interfacing with the government, and will maintain a schedule for the completion of key requirements. At times, this staff will work directly with agencies on policies and submittals. In other instances, government personnel will be referred to other appropriate NWA staffs. When several NWA staffs are involved in developing complex policies, the Regulatory and Governmental Affairs staff will ensure a consistent and effective approach by coordinating the effort of all staffs. The Regulatory and Governmental Affairs

4.1 REGULATORY AND GOVERNMENTAL AFFAIRS (Continued)

staff will be a principal point of contact for the Office of the Federal Inspector (OFI) throughout the project. This staff will maintain a broad understanding of NWA policies. They will work on substantive issues with OFI and will provide a constant, readily available, and effective interface point. When the OFI needs to work with other NWA staffs on technical matters or other specialized subjects, direct communications will be established between the OFI and those staffs. The Regulatory and Governmental Affairs staff will maintain an awareness of work done directly between NWA staffs and the OFI, or other government agencies. The Vice President of Regulatory and Governmental Affairs will advise the NWA President and Chairman concerning the impact of government requirements on key project decisions.

The principal office for Regulatory and Governmental Affairs is in Washington, D.C., but throughout project, they will locate personnel wherever needed to interface with the government. Currently, there are Regulatory and Governmental Affairs personnel in Washington, D.C., Alaska, and with the PMC in Irvine, California. The Regulatory and Governmental Affairs staff will have primary responsibility for obtaining major government approvals. Major government approvals are considered to be those requirements that have a broad impact on the project. These include grants of right-of-way from the Department of the Interior and the Certificate of Public Convenience and Necessity from the Federal Energy Regulatory Commission. The Regulatory and Governmental Affairs staff will determine what submissions should be prepared and will work with all NWA staffs to prepare and submit the appropriate applications. In the case of approvals requiring extensive applications, the Regulatory and Governmental Affairs staff will identify requirements to be fulfilled by other NWA staffs and work with those staffs to satisfy the requirements. When approvals require less extensive applications, Regulatory and Governmental Affairs will either take the lead in preparing submittals or pass the requirement on to the appropriate NWA staff for resolution. For example, the NWA Affirmative Actions Programs staff will work directly with OFI personnel involved in the area of affirmative action.

4.2 ALASKAN OPERATIONS

The Alaskan Operations Office will have responsibility for obtaining permits in Alaska, managing socioeconomic affairs, and obtaining land use rights other than the basic Federal Right-of-Way Grant (that grant will be acquired by the

4.2 ALASKAN OPERATIONS (Continued)

Regulatory and Governmental Affairs staff). This office will interface with government personnel in Alaska to determine what permits are required and to coordinate the application, review, and approval process. The Alaskan Operations Office will also interface with the government concerning socioeconomic affairs. This will primarily involve working with local and state government organizations.

The Alaskan Operations Office and the Regulatory and Governmental Affairs staff will closely coordinate their activities. Regulatory and Governmental Affairs will inform the Alaskan Operations Office of the provisions of major government approvals and the nature of other government coordination conducted in Washington, D.C., so that these agreements will be reflected in permit applications. Permits obtained by the Alaskan Operations Office will, when appropriate, be provided to Regulatory and Governmental Affairs for use in applying for Notices-to-Proceed and other approvals.

During the preconstruction phase, the Vice-President, Alaskan Operations, will be the senior NWA representative permanently located in Alaska. As such, that individual will interface with senior state and federal agency officials in Alaska when senior NWA representation is required. These interfaces will be closely coordinated with the Vice-President, Regulatory and Governmental Affairs, to ensure a consistent approach. During the construction phase, senior NWA managers in the areas of Environmental Programs, Quality Assurance, Engineering and Construction, and Construction Management, will be permanently located in Alaska to coordinate with government personnel as required. The Vice-President of Alaskan Operations will continue to maintain an overall perspective of government relations in Alaska and responsibility for acquisition of permits in Alaska will remain with the Alaskan Operations staff throughout the preconstruction and construction phases.

Examples of permits to be obtained by the Alaskan Operations Office are: temporary land use permits from the Department of Interior, FAA permits for construction near airfields, permits for the discharge of pollutants from the Environmental Protection Agency, and permits for construction activity near navigable waterways from the Corps of Engineers and the Coast Guard. The Alaskan Operations Office will notify other NWA staffs of what material they should prepare (or have prepared by the PMC) for permit applications. The Alaskan Operations staff will then coordinate the preparation of submittals and provide the appropriate interface

4.2 ALASKAN OPERATIONS (Continued)

with permitting authorities in Alaska. When site-specific permits are to be issued in Washington, D.C., the Alaskan Operations Office will coordinate with the Regulatory and Governmental Affairs staff to avoid duplication of activities.

4.3 ENGINEERING AND CONSTRUCTION

The Engineering and Construction organization will interface with the government on technical matters and at work sites. It will work with agencies and the OFI to develop designs, construction procedures, and schedules which meet government requirements for environmental soundness and safety. Members of the Engineering and Construction organization will work with the Regulatory and Governmental Affairs staff and the Alaskan Operations Office to develop technical solutions to problems which are relevant to governmental concerns. The Engineering and Construction staff will develop technical material required in applications for permits and approvals. The preparation of technical material for applications will be closely coordinated with Regulatory and Governmental Affairs and the Alaskan Operations staff to expedite progress on permits and approvals. Engineering and Construction personnel will work with other NWA staffs to mesh schedules for obtaining permits and approvals with schedules for design and construction activities. During both the preconstruction and construction phases, the Engineering and Construction organization will station people at work sites to provide NWA overview and direction of field activities. These personnel will interface with government field inspectors. They will make themselves available to answer questions of government inspectors, work with inspectors to ensure compliance with stipulations, and to resolve within defined limits any field-level problems that arise concerning permits or other government concerns.

NWA will act as a single window for OFI and government agencies involved in the project. In this capacity, NWA will work with OFI to coordinate communications between contractors, such as the PMC, design contractors and execution contractors, and government agencies. The bulk of this coordination, that which is routine in nature, will be handled through direct day-to-day working relationships between NWA managers and OFI personnel. These communications will be monitored by the Regulatory and Governmental Affairs staff to ensure that they are effective and consistent. Coordination of major policy matters will be handled by the

4.3 ENGINEERING AND CONSTRUCTION (Continued)

NWA Offices of the Chairman and President, with assistance from the Vice Presidents whose area of responsibility is relevant to the policy matter being considered.

Figure M-22 depicts how various NWA staffs will be involved in coordinating aspects of the government interface. The subjects of interface indicated on that chart are not all inclusive, but rather are indicative of the types of issues that will be handled by each staff.

INTERFACES BETWEEN NWA AND THE GOVERNMENT

STREES BETWEEN NWA AND THE GOVERNMENT		
Northwest Alaskan staff	Subject of Interface with Government Agencie and Office of the Federal Inspector	
Regulatory and Governmental Affairs	 Overall coordination of Government Interface Fulfillment of major approval requirements (e.g DOI grant of right-of-way, Certificate of Public Convenience and Necessity) 	
Alaskan Operations	 Acquisition of site-specific permits Coordination of socioeconomic work with loca Government 	
Engineering and Construction	 Coordination of design for purposes of meeting safety requirements Interface with Government field inspectors Submittal of cost and schedule data to the OFI as required 	
Quality Assurance	 Explanation and confirmation of inspections to ensure that environmental and safety precaution are properly implemented Reports of nonconformances 	
Environmental Programs	 Confirmation that environmental safeguards are effective Approval of measures for protecting the environment 	
Public Affairs	 Cooperative efforts with Government agencies a provide information to the public Issuance of information to Government agencie 	
Administration	 Design and administration of affirmative action programs 	
Finance	 Submittal of financial reports to the FERC Coordination of financing arrangements with th State of Alaska and any involved Federal organiz 	

5.0 PROJECT MANAGEMENT REQUIREMENTS

To ensure that the project is designed and built in the most cost-effective manner, within all regulatory constraints, and within the scheduled time frame, NWA has established policies in each major management area.

Each of these areas of management requirements is described in terms of an overview of its importance and potential impact on the project, and NWA's policies for fulfilling the requirement. While major policies are identified in this plan, more detailed descriptions of project policies are contained in the individual plans prepared by specific functional staffs. These supporting plans identify the procedures needed to implement policies and will continue to be refined where appropriate.

The areas covered in this section are:

- o Environment
- o Permits and approvals
- o Design
- o Purchasing and material management
- o Records management
- o Quality program
- o Communications
- o Construction and logistics
- o Labor relations
- o Support services
- o Contracts
- o Socioeconomic affairs

5.1 ENVIRONMENT

5.1.1 Overview

Protection of the environment is a critical task which will affect every other aspect of project management. Previous arctic construction experience demonstrates that it is necessary to incorporate environmental considerations throughout design and construction.

Based on input from federal and state agencies, NWA is conducting biological, civil, and physical programs to support environmental decisions with respect to designs, scheduling, and construction methods. An environmental plan will be developed to integrate the operational details of construction with the need for environmental protection. Additional detail is also available in the environmental protection plans associated with specific NTP applications.

The environmental programs are described below.

<u>Biological programs</u> - NWA has been active in developing a baseline of biological data since 1976. Studies to date have included raptor surveys, wetland and terrestrial bird surveys, sandhill crane migration surveys, fisheries and stream surveys, archaeological studies, and habitat mapping. Typically, these studies have been designed by NWA and the PMC, with input from concerned agency biologists, and have been carried out by qualified consultants. The results of this work have been submitted to Federal and State agencies.

Environmental civil programs - These programs focus on supporting civil engineering work. The scope of this work includes clearing and grading, as well as work on access roads, material sites, workpads, disposal sites, and both temporary and permanent facilities. Technical support and review by environmental personnel will be a major part of planning for drainage structures, erosion control, and restoration.

<u>Physical programs</u> - Physical programs address the environmental matters related to the design and operation of physical facilities, such as compressor stations, camps, and work sites. These programs will result in guidelines for dealing with waste disposal, hazardous substances, water resources, and air quality.

5.1.2 Policies

The following policies will be used as the basis for the environmental plan.

Environmental Data - Environmental information will be acquired and organized on a site-specific basis. These files will provide a central source of information for field and office, and will provide data to designers, planners, contractor staffs, and governmental agencies. All available relevant environmental information will be contained in these files, including that developed through NWA programs and data acquired from other sources, such as Alyeska. It will be updated by ongoing studies and field observations.

Environmental requirements will be incorporated in EC contracts. Each EC will bid with a knowledge of the environmental constraints (e.g., design, schedules, and methods) associated with work locations.

NWA will work closely with federal and state agencies to meet all environmental regulations. Technical design criteria are continually being solicited from federal and state agencies throughout the design of NWA's environmental programs. This will continue throughout the preconstruction and construction phases of the project.

NWA will monitor environmental orientation and training programs to ensure that they are conducted in an effective <u>manner</u>. Programs will be prepared for initial orientation of field personnel and for ongoing environmental training. NWA will ensure that field personnel are aware of sitespecific environmental constraints.

5.2 PERMITS AND APPROVALS

5.2.1 Overview

The majority of the Alaska Segment will cross federal or state-owned lands, and will require a number of permits from many different agencies for preconstruction and construction activities.

Additionally, the Federal Inspector is required to approve many important elements of the project. Careful management

5.2.1 Overview (Continued)

of the entire process for obtaining permits and approvals will be a critical factor in the overall success of the project.

NWA will accommodate all agencies involved and comply with all permit and approval requirements while maintaining a cost-effective design and construction effort. NWA will continually review its policies and procedures to ensure that permits and approvals are obtained and complied with.

5.2.2 Policies

NWA will obtain project-related permits and provide them to contractors. Responsibility for obtaining some contractorspecific permits (e.g., approval to do work in the State of Alaska and vehicle licenses) will be delegated to individual contractors. Contractor responsibilities regarding permits will be clearly defined in contracts with ECs.

Starting in the preconstruction phase and continuing through construction, NWA personnel will establish close working relationships with government personnel involved in reviewing permit applications. In this way, questions concerning applications can be resolved quickly and permits obtained efficiently. NWA management personnel will consult with government personnel working in corresponding functional and technical areas to develop an early understanding of how permit requirements should be interpreted and what types of designs and procedures will be required to meet permit requirements.

The following policies will guide all permit and approval activities:

The NWA Alaskan Operations Office will have overall responsibility for acquiring permits. This staff will work with permitting authorities and will coordinate the preparation of material for permit applications by NWA staffs.

NWA will maintain an up-to-date list of permit requirements and a schedule for obtaining those permits. A current list of requirements will be maintained to provide adequate lead time for obtaining permits. NWA staffs will submit their permit requirements to the NWA Alaskan Operations Office, which will establish a permit schedule. NWA will furnish

5.2.2 Policies (Continued)

the Federal Inspector and appropriate agencies with a schedule of when permits will be required so that the government can issue approvals as they are needed.

The schedules for meeting permit requirements will be integrated with project construction schedules so that the permits can be acquired without delaying construction activities. These schedules, together with a description of anticipated limitations and restrictions to be imposed by permitting authorities, will be included in EC bid packages.

The PMC will provide detailed input for permit applications in accordance with NWA's schedule and guidelines. NWA will direct the PMC to prepare detailed design data and other material required for permit applications. When material is
required from ECs or other contractors, the PMC will require the appropriate contractor to provide the data to NWA.

NWA's field teams will help coordinate permits on job sites. They will monitor contractor activities to ensure compliance with permit provisions. They will also assist in expediting permit acquisition and will coordinate project activities with government personnel in the field.

A typical permit approval process is depicted on Figure M-23, at the end of this section.

5.3 DESIGN

5.3.1 Overview

NWA's policies will ensure that the final design of the Alaska Segment is reliable and economical. Further, the system will be planned and designed so that initial gas deliveries can be made at the earliest possible date, and at the least cost to consumers.

NWA and the PMC will coordinate all contractors and support functions in the design process, and will work closely with the government in the required review process.

The final design is the detailed specification of the entire system to meet capacity, regulatory, and environmental requirements. In managing the design, a number of activities will be performed:
5.3.1 Overview (Continued)

o Detailed engineering.

o Coordination of government reviews.

o Coordination of field design activities.

Each of these is discussed below.

5.3.1.1 Detailed Engineering - The design of major elements for the project will proceed as follows:

Develop design criteria - To support the development of design criteria, NWA and the PMC are collecting preconstruction field data. Programs in this area include the development of environmental and socioeconomic baselines, collection of site-specific geotechnical and hydrological data, and surveying and mapping activities. Once the design criteria are established and approved by OFI, the various design contractors will develop the final designs under the direction of the PMC.

<u>Develop final design</u> - The final design will be accomplished by the PMC and the engineering contractors for each of the major project elements. The PMC will supervise final design preparation and compile final design packages.

<u>Project design cost estimates</u> - When final design and material specifications are complete, the PMC will prepare detailed work packages and cost estimates. Once reviewed and approved by NWA, these cost estimates will become the final design cost estimate.

These three steps will be followed for all major elements of the project and will be reviewed and approved by appropriate regulatory agencies as they are completed.

5.3.1.2 Coordination of Government Reviews - NWA has recommended that the government conduct continuing design reviews, beginning before submission of final designs. Coordination with state and federal government officials will keep them aware of the progress and direction of the design efforts. These coordination efforts will include periodic general progress reviews and reports on results from field and engineering tests.

5.3.1.3 Coordination of Field Design Activities - Unexpected conditions encountered in the field may require some design changes. Field design manuals will be prepared to

5.3.1.3 Coordination of Field Design Activities (Continued)

support engineers making these decisions, and to provide them with detailed guidance. The PMC will prepare these manuals as part of the design process for each major element. The PMC will also be responsible for coordination of field engineering at each site and with the responsible design contractors.

5.3.2 Policies

NWA has established the following policies to guide the design activities of all project elements.

Outside expertise will be used, whenever required, to develop detailed designs. NWA will require the PMC to engage specialty contractors to develop designs for certain project elements. The use of experienced specialty contractors ensures that the highest quality designs are being produced in the most efficient manner. Direction and control of all design contractors are the PMC's responsibility.

Staged design will be used for the project. Permanent facilities will be grouped into four independent, major design elements:

- o Pipeline and civil
- o Compressor and metering stations
- o Operation and maintenance facilities
- o Supervisory control and communications systems

Under the stated schedule, a final design, design cost estimate, and detailed construction schedule for each of the design and construction elements will be submitted before construction begins on that element. Each element will be treated as a discrete design task because each involves different physical units (e.g., pipeline versus compressor station), has different design requirements and construction schedules, and will be handled, to a large extent, by different contractors.

Design work will be performed simultaneously on the four major elements. However, the final design, design cost estimate, and construction schedule for each of the elements will be completed and submitted separately, in the sequence dictated by the overall work schedule. The selection of the

5.3.2 Policies (Continued)

staged design approach was made after consideration of the requirement in the <u>Decision and Report to Congress on the</u> <u>Alaska Natural Gas Transportation System</u>, to "give consideration to various management approaches - such as fast track, staged design, and other management approaches - that will facilitate the cost-effective, environmentally sound and timely construction of the project." The staged design approach is particularly well suited to this project, and has been chosen after study of alternative methods.

Control of design quality will be ensured by the use of detailed design procedures. The PMC will provide the detailed design procedures to NWA for approval. Upon approval, these procedures will become the project-wide standards to be followed by all design contractors, unless alternate procedures - ensuring the same quality and timeliness - are approved by NWA for a contractor's internal use.

<u>Government interface will be established early in the design</u> <u>process</u>. NWA is committed to a continuing process of design review and approval by the government. This policy will permit early resolution of issues that could cause delays or rejection of entire designs later in the review process.

Studies will be conducted to confirm design validity. Whenever NWA considers them necessary, field or laboratory tests and studies will be performed to confirm the validity of the parameters used in a design. As environmental and engineering studies continue, designs will be confirmed and, where necessary, refined and expanded.

Hydrostatic testing will ensure structural integrity of the pipeline. Final pipeline design will be verified by means of hydrostatic tests. The methods and procedures for the tests will be submitted to the OFI for approval. These tests (in addition to the cooperative government review process throughout the design effort) will provide proof of structural integrity before startup of the system.

Other tests will be conducted to ensure that all components and systems meet serviceability criteria. These will include tests of electrical systems, compressor stations, operational communications systems, and operational procedures.

5.4 PURCHASING AND MATERIAL MANAGEMENT

5.4.1 Overview

NWA will monitor and direct the PMC's procurement, material movement, and distribution procedures throughout the project. NWA will approve and monitor all PMC policies and procedures and will require corrective action where appropriate. The PMC will perform the actual purchasing and material management functions, and will be responsible for documentation, tracking, and payments. A limited number of qualified suppliers will be available for various components, and NWA will closely coordinate major purchasing and traffic activities with other segments, so as to minimize purchasing conflicts between segments.

The range of purchasing functions performed by the PMC and the material management functions performed by NWA will encompass the following seven basic steps:

<u>Preparation of material lists</u>. The PMC will prepare material lists, and NWA's engineering group will review and approve these lists according to the project design review procedures.

<u>Preparation of specifications</u>. From the design criteria, the PMC will prepare the specifications for all system components and material. NWA's engineering group will approve all major specifications according to the project's procedures.

Distribution of a request for quotation (RFQ). The PMC will solicit bids from qualified vendors, who will be selected from a list approved by NWA. The RFQs will include all specifications and terms necessary for prospective vendors to complete a competitive bid.

Evaluation of bids received. The PMC will perform an analysis of all bids received to determine the vendor's ability to meet specifications, price requirements, and delivery schedules. An NWA engineer will be assigned to the evaluation effort if the purchase price exceeds certain predetermined limits, or if material is considered critical to the project. In addition, NWA will continually monitor the PMC's vendor evaluation process.

<u>Selection of a vendor</u>. The PMC will recommend vendors to NWA based on evaluation of bids. NWA will review bids and either approve the recommendations or request further analysis

5.4.1 Overview (Continued)

and a revised recommendation. NWA will monitor bid evaluations for all vendors; particular attention will be paid to vendors for high dollar value items and items for which quality standards are a particularly critical concern.

<u>Preparation of a purchase order</u>. Once a vendor is selected, the PMC will prepare an NWA purchase order in accordance with the material specifications and bid requirements.

Transportation from the vendor's location and receipt of components at the staging area. The PMC will be responsible for all traffic functions involved in shipping purchased material and components to the project marshalling or staging areas. These areas will be used to assemble the materials for direct shipment to work sites. At these stop-off points, the PMC will manage all receiving functions, such as inspection, documentation, and preparation for storage and shipment to final destinations. NWA's Logistics Director will direct and monitor and PMC's traffic and receiving activities. Additional detail on procurement organization and procedures is contained in the Procurement Plan.

5.4.2 Policies

The following purchasing and material management policies have been established for the project:

The PMC will perform all procurement, expediting, inspection, and traffic functions and will be responsible for documentation and tracking activities. NWA will direct and monitor the PMC's activities by requiring approvals during the procurement process and by continuously monitoring the PMC's performance.

NWA purchase orders will be used for all project purchases. The PMC will prepare the purchase orders, track progress against delivery dates, confirm shipments, and make payments as NWA's agent.

Although U.S. sources will be used to the maximum extent possible, foreign sources will be considered in cases where they would permit significant reduction in the cost of gas to consumers, where they have to be used to avoid delays, or where foreign sources offer superior quality.

5.5 RECORDS MANAGEMENT

5.5.1 Overview

Automated storage and retrieval will be used to control project records. Project records policies will provide a consistent framework for this storage and retrieval. These policies will be administered by NWA for all project participants and implemented by the PMC during design and construction. The system will employ proven technologies and will avoid technologies that have not yet been tested in a similar environment.

The records control system will be capable of handling records in various forms (e.g., drawings, papers, film, microforms) with various retention periods. Records will be collected from many locations, including remote field sites, and will be made available for retrieval at other locations.

While individual departments will be responsible for determining their own information needs, the storage, retention, and retrieval of that information will follow project-wide record control policies.

5.5.2 Policies

The major policies currently specified for the project are described below.

Project record control policies will apply to all contractors, as well as to the NWA organization. Individual contractors may follow their own internal records policies in addition to NWA policies. However, consistent project-wide policies are necessary to control the large amounts of data and the complex retrieval demands which are anticipated. These policies will set minimum requirements for retention, quality of records submitted, and schedules for submittal.

During design and construction, the PMC will operate and control project records and data management, except for financial accounting and partnership records. NWA will approve all record control policies, and will monitor PMC compliance through periodic checks of all record control activities.

<u>NWA will operate and control financial accounting records</u> and data. These records will include:

- o Debt and equity accounting records.
- o Tax reporting records.

5.5.2 Policies (Continued)

- o General ledger and all accounting records for work order data to be used in FERC reporting.
- o NWA accounts payable records.
- o Project audit records.

NWA will also maintain the legal and partnership records not specifically needed by the project group. The policies and procedures used for the system to be implemented by NWA will be consistent and compatible with those covering the project system to be implemented by the PMC.

5.6 QUALITY PROGRAM

5.6.1 Overview

NWA will be guided in its overall approach to quality by the partnership policy which calls for the highest degree of functional integrity and reliability that is practicable. NWA's approaches to quality assurance (QA) and quality control (QC) are summarized in this section. More complete descriptions are provided in the Quality Plan.

5.6.1.1 Quality Assurance - Quality Assurance will be the ultimate check on project quality. As such, it will be a responsibility retained by NWA. Through the Director of Quality Assurance and the quality assurance staff, NWA will approve all quality control procedures, and will audit compliance with these procedures.

The quality assurance function will be involved from design inception through construction, to final testing and acceptance.

During the preconstruction phase, NWA's quality assurance staff will audit the PMC's compliance with the quality control procedures dealing with design review, documentation, compliance with government requirements, and contractor reviews. NWA is also performing QA on field programs in Alaska.

During construction, NWA will ensure that all required inspections are being made, that required documentation is in order, and that the PMC is performing its continuous inspection role. The NWA quality assurance group will also audit final test and acceptance procedures.

5.6.1.2 Quality Control - The PMC will be responsible for quality control and inspection throughout the project. The PMC will specify vendor and contractor quality control requirements, and provide continuous inspection during construction.

During design and procurement, the PMC's quality control activities will include review and approval of design contractor's internal quality control procedures, as well as inspection and approval of subcontractors' finished products. The quality control staff will monitor the PMC's acceptance and integration of all designs, and ensure that all quality control activities during design have been adequately documented. For procurement activities, PMC quality control will approve the vendors' in-plant quality control procedures and perform inspections in vendor manufacturing facilities for critical items. The quality control group will also periodically review the quality control activities of vendors during actual fabrication to ensure that approved procedures are being followed. The program must provide adequate inspection and traceability, where required, as well as complete documentation.

During construction, the PMC's quality control group will provide inspectors for continuous monitoring of construction activities. Any exceptions noted during any quality control activity will be handled according to the quality procedures approved by NWA.

5.6.2 Policies

The comprehensive project quality policies are discussed in the Quality Plan previously described. However, major project policies are summarized below:

- NWA's quality assurance group will approve all project quality procedures. These procedures may be standard vendor or contractor procedures, or they may be specially developed by the PMC or others for this project. By ensuring in advance that all quality control procedures are adequate, NWA will have a direct impact on the actual quality of the material produced and work performed.
- Documentation of quality inspections will receive high priority by all NWA organizations. NWA organizations, in their day-to-day monitoring of PMC activities, will ensure compliance with quality and inspection documentation procedures 'in order to

5.6.2 Policies (Continued)

provide traceability and to avoid cost and schedule problems.

- Quality assurance and quality control criteria will be among those factors used in selecting contractors, subcontractors, and vendors.
- o Specific quality control guidelines will be incorporated in contracts, when appropriate.

5.7 COMMUNICATIONS

5.7.1 Overview

The PMC will have the responsibility for providing an effective communications network. Accordingly, specialized, dedicated systems will be required for many of the communications tasks.

Facilities will be provided for communication between the major camps and station sites to the Fairbanks construction headquarters and the Operations Control Center. Major systems will be installed according to NWA specifications and used by all construction organizations with the PMC managing all communications during construction. When construction is completed, systems will be tailored for NWA use during operation and will become an integral part of the pipeline operated by NWA.

5.7.2 Policies

NWA has established the following policies for communications:

System-wide communications will be centrally coordinated by the PMC as directed by NWA. All users during preconstruction and construction will comply with communications procedures established by the PMC and approved by NWA. Users will operate the communications equipment under their control (e.g., execution contractors will operate phone and radio communications in their camps) but will follow project-wide communications procedures. Each user group in a location, such as the government inspectors, the PMC, execution contractors, and NWA, will have dedicated telephone lines for their use. The assignment of communication priorities and control of use will be centrally coordinated by the PMC.

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5.7.2 Policies (Continued)

The "project-wide" communication system will be provided by the PMC for use by execution contractors. Even though individual contractors will operate communications systems within their area, a project-wide system of intercamp and interstation communication using primarily a microwave telephone system will be provided for use by ECs. This system will be supplemented by intercamp radio communications capability during construction. The project-wide system provided by NWA will be the primary communication system during operation, as well as construction. The basic system will be completed before construction begins, and the design and installation of that system will be based on operational as well as on construction needs.

Existing systems and facilities will be used where practical, and supplemented by new systems only where necessary. Once the detailed performance and capacity requirements are set, all available alternatives for a project-wide system will be thoroughly investigated. Wherever practical, dedicated use of capacity on these systems will be requested and negotiated. If use of existing systems proves practical and economical, new elements of the system will be designed and installed where needed to supplement the existing system. However, communications capability will not be reduced below required levels simply to avoid installation of a new system.

5.8 CONSTRUCTION AND LOGISTICS

5.8.1 Overview

The actual construction of temporary and permanent facilities for the transportation system will be the largest element of cost. NWA's overall Construction and Logistics plan is based on three fundamental concepts. The first is contained in the "President's Decision" and requires the use of fixed price contracts.

The second concept calls for decentralization of as much authority and responsibility to the field level during construction as is practical. In order to gain the advantages of fixed price construction contracts, quick field decisions by NWA or the PMC are required to allow execution contractors to maintain progress. NWA will ensure that sufficient authority is delegated to the field to provide effective decision making.

5.8.1 Overview (Continued)

The third concept applies to construction logistics. NWA will provide the permanent in-plant material (e.g., pipe, compressors, large valves) and major support systems which are most efficiently procurred centrally (e.g., camps, project-wide communications system). Execution contractors will provide their own equipment, spare parts, and consumable supplies. Thus, contractors will control virtually all of the elements of their tasks in the field.

There are three primary areas of responsibility within construction and logistics:

o Construction and logistics planning.

- o Critical item logistics.
- o Construction management.

A brief description of these areas is given below. A more detailed discussion is contained in the Construction and Logistics Plan.

5.8.1.1 Construction and Logistics Planning - The PMC and execution contractors will be directly responsible for controlling certain aspects of transportation, establishing and maintaining storage points and facilities, and keeping construction activities supplied and on schedule. NWA will take the lead in developing a logistics plan, and will direct the PMC's logistics activities according to the procedures outlined in the plan.

5.8.1.2 Critical Item Logistics - The PMC will retain responsibility for the logistics chain required to supply critical in-plant materials to execution contractors. Consequently, the PMC will be required to establish the necessary transportation from vendors to Alaskan ports, from ports to centralized warehouses or yards (if used), and from these centralized points to the execution contractors' lay-down sites. In addition, the PMC will establish centralized pipe double-jointing and coating facilities to avoid costly duplication of facilities.

5.8.1.3 Construction Management - Fixed price execution contracts will be managed by the PMC under the direction and monitoring of NWA. Execution contractors will manage their own labor, equipment, techniques, and costs. The PMC will provide overall direction to execution contractor management, supply engineers from its own staff or from design

5.8.1.3 Construction Management (Continued)

contractors for field design changes, and perform the quality control role outlined in the quality program section of this plan and in the NWA Quality Plan.

NWA will locate a team of personnel at each construction site with authority to make a wide range of construction decisions on the spot. Thus, for problems encountered by execution contractors during day-to-day construction activity, the PMC will be able either to provide the necessary guidance directly or gain a decision quickly from NWA personnel on site. The Fairbanks headquarters personnel will make decisions relative to policy disputes or problems with major cost impact. Thus, the execution contractor will be able to obtain quick decisions from the PMC and, when necessary, from NWA.

5.8.2 Policies

NWA has established the following construction policies:

Fixed price contracts will be used for all major construction activity. The "President's Decision" requires that some form of fixed price contracting must be used in execution contracts. NWA fully endorses this concept and will use fixed price contracts wherever there is significant opportunity to lower costs, even in areas other than actual construction of the permanent facilities.

A decentralized approach to construction decision making will be employed. NWA will delegate the maximum possible decisionmaking authority to field personnel while maintaining central policy and control authority. Decision authority required to carry out routine work on a spread or station will be self-contained in that geographic area. Thus, execution contractors will obtain quick decisions from field personnel with area-specific knowledge. Clear guidelines will identify those decisions that, because of their effect on project-wide policies or costs, cannot be delegated to the field level.

Execution contractors will control as much of their operation and support as is practical. Execution contractors will have responsibility for:

- o Labor
- o Construction equipment
- o Spare parts

5.8.2 Policies (Continued)

- o Consumable material and supplies
- o Transportation for consumables and personnel
- o Catering
- o Camp administration and security

NWA, through the PMC, will supply only those materials and facilities for which there are critical quality considerations or which would be more expensive if supplied by each contractor - for example:

Certain major items of material, such as mainline pipe, large valves, and compressor station piping.

Camps (but not the camp administration).

Construction contract bids will be sought in a manner that minimizes risk. To ensure that the cost advantages of fixed price contracts are realized, NWA will take steps to reduce a contractor's uncertainty before final bids are submitted. Three methods will be used to reduce uncertainty. First, NWA will ensure that adequate engineering is completed for each bid package before bids are requested. Contractors will then be better able to estimate the work requirements in a package and make a total package estimate with confidence. Second, pre- and post-bid conferences will be held to answer contractors' questions and clarify any points of uncertainty. Third, NWA will give potential bidders the opportunity to perform on-site evaluations before bids are submitted. This will be accomplished by providing a preliminary package to qualified bidders in time for a summer, on-site review. Again, this step to reduce uncertainty will allow contractors to submit bids with less contingency reserves.

Three construction seasons will be used to complete the project. By dividing the work into geographical elements for each contractor, a series of three seasons will provide adequate time for construction, testing, and commissioning while addressing environmental constraints and concerns.

The entire system will use the "corridor concept" to the maximum possible extent. The corridor concept calls for the use of existing utility corridors, or rights-of-way, wherever possible. Disruptions to the environment as well as costs

5.8.2 Policies (Continued)

of establishing a new corridor are thus minimized. Also included in the NWA corridor concept is the use of existing support facilities (e.g., camps, communications system) whenever possible for the same reasons. The entire NWA route is based on the corridor concept, using the existing Alyeska and Haines rights-of-way and facilities wherever possible.

Maximum use will be made of existing, relevant experience and proven technologies. While large diameter pipeline construction in the arctic conditions of Alaska is still a relatively new endeavor, significant experience exists from TAPS and Canadian ventures. NWA will use this experience in the form of personnel, methods, literature, and studies, to avoid duplicating work already accomplished on previous jobs or "relearning" any concept or practice. Similarly, NWA will avoid the use of unproven technologies for critical design elements.

5.9 LABOR RELATIONS

5.9.1 Overview

NWA's labor relations approach is based on having independent contractors with control over the resources needed to accomplish their work. Accordingly, NWA will encourage the negotiation of project-wide labor agreements, to be administered by the execution contractors for their own craft employees. This approach will give contractors control over their own labor, while providing a consistent set of labor rates, jurisdictions, grievance procedures, and work rules.

Since a number of unions will be working on the project, NWA will recommend that the traditional agreements between building trades and contractors (AGC) and pipeline unions and contractors (PLCA) be used as models. The local unions in Alaska, as well as the international unions, will take part in the negotiations.

NWA will include provisions in contracts to require contractors to comply with affirmative action regulations and other regulatory requirements. Beyond compliance with these regulatory requirements, contractors will be allowed the flexibility to manage their labor in the most efficient manner. NWA will directly manage labor relations for the relatively small number of NWA employees.

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5.9.2 Policies

NWA policies, listed below, will be implemented by the NWA Director of Employee Relations and, when appropriate, will be reflected in contracts with contractors.

The expertise of major contractors and contract associations will be fully utilized in negotiating agreements with labor unions. NWA will not become directly involved in labor negotiations, but rather, will allow contractors to form negotiating groups and formulate labor agreements based on their long-standing relationships with the principal unions.

<u>Contractors are required by law to comply with affirmative</u> <u>action regulations</u>. Each contractor will be individually accountable for fulfilling those responsibilities. NWA will direct and monitor the PMC in its actions and in supervision of other contractors.

5.10 SUPPORT SERVICES

5.10.1 Overview

Support services consist of those auxiliary activities required to support contractors as they perform their principal function of design or construction. These include catering, safety, security, insurance, medical services, camp management and maintenance, training, arctic clothing supply, and transportation.

NWA will require contractors to provide their own support services, and will actively direct only those support services required for NWA personnel.

The requirements for contractors to provide their own services will be clearly specified in contracts so that these costs can be included in their bids.

5.10.2 Policies

The following support services policies have been established for the project.

ECs will also be required to provide catering for their own employees and for an agreed-upon number of non-EC people working in the EC's geographic area. These non-EC people will include NWA, PMC, and government personnel. There will be

5.10.2 Policies (Continued)

contingencies for ECs to provide catering at an agreed-upon rate for additional non-EC transient personnel. Thus, catering will be available throughout the construction area for all personnel associated with the project.

NWA will specify minimum safety guidelines for ECs. These guidelines will be consistent throughout all areas and will be incorporated in requests for quotations and subsequent contracts. ECs will establish safety procedures in their respective work areas. These procedures will comply with NWA guidelines as well as state and federal regulations. ECs will be independently responsible for satisfying safety regulations. NWA will not play an intermediary role between ECs and agencies concerned with safety practices.

In the interest of promoting sound safety practices, NWA will have ECs submit information on effective safety practices for project-wide distribution. This will keep all project personnel informed of potential hazards, and will allow contractors to adopt special procedures developed by their colleagues.

ECs and NWA will provide security for their respective property. NWA will establish basic security guidelines for ECs. ECs will secure equipment and property either owned by the EC or under EC control in accordance with these guidelines.

The PMC will secure centralized facilities and the ownerprovided components of the system before they are turned over to the ECs. ECs will provide security on job sites, and EC fabrication sites.

Contractors will provide their own insurance. ECs will be required by contract to carry insurance to cover a reasonable level of liability. NWA does not consider itself responsible for claims against contractors, and will expect contractors to take responsibility for indemnifying themselves.

ECs will provide medical services on each section of the pipeline to meet guidelines established by NWA. ECs will be required to make medical facilities available for the entire length of the pipeline. They will be required to utilize existing local medical facilities where available. Medical evacuation capability will be provided by each contractor, and NWA will require ECs to establish cooperative agreements, coordinated by the PMC, so that expeditious emergency evacuation is available for all project personnel at any point

5.10.2 Policies (Continued)

along the project. ECs will also provide medical services to non-EC personnel to include NWA, PMC, and government personnel involved in the project.

ECs will provide their own camp operation and maintenance in their respective areas of responsibility. NWA will rehabilitate camps and prepare them for occupation by ECs. When ECs move to Alaska, they will take over camps and be responsible for their operation and maintenance thereafter. In some instances, other contractors will have personnel at a camp; in those cases, a contractual rate will be established for providing lodgings, and ECs will be required to reserve a specified number of beds, based on projected demand by other contractors. Similar arrangements will be made for lodging NWA, PMC, and government personnel.

Each major organization will provide its own training. This will range from training in cold weather survival methods to the teaching of craft skills (e.g., equipment operation, welding, etc.). Unions will be responsible for providing training for their own personnel. NWA and the PMC will provide training for their own personnel, but not for the project as a whole. ECs will provide their own training in accordance with guidelines established by the PMC as directed by NWA. The content and effectiveness of this training will be monitored by the PMC as directed by NWA.

<u>Clothing will be issued by individual contractors for their</u> <u>own employees</u>. NWA will set minimum clothing standards which ECs will meet or exceed.

Spare parts, petroleum oil, and lubricants (POL), and consumables will be supplied by ECs through commercial channels. Construction consumables will also be supplied by ECs for their own needs.

Other types of service support will be handled in similar fashion, with emphasis placed on EC self-sufficiency.

5.11 CONTRACTS

5.11.1 Overview

The "President's Decision" requires that, where practical, execution contracts for the construction of the transportation system shall be on a fixed price basis. NWA has, therefore,

5.11.1 Overview (Continued)

adopted a fixed price approach to contracting, and is developing management policies which are consistent with fixed price contracting.

Several types of fixed price contracts will be used, including fixed unit price contracts. This type of contract, commonly used in pipeline work, establishes a price for a particular unit of work. Other types of fixed price contracts may also be considered, such as lump sum contracts and fixed price incentive contracts.

5.11.2 Policies

NWA has established the following policies regarding project contracts:

<u>NWA will provide detailed bid packages</u>. Fixed price contracts make it particularly important to provide a detailed description of the scope of work for each contract. Such a description provides bidding contractors with the maximum opportunity to accurately estimate their costs, minimize their risks, and submit competitive bids. For this reason, sufficient design work will be accomplished during the preconstruction phase of the project before bids are solicited. NWA will furnish bid packages complete with detailed designs, stipulations, schedules, descriptions of affirmative action goals, reporting requirements, and other information necessary for contractors to prepare fixed price bids.

Firm fixed price contracts will be used whenever possible. In those cases where it is possible to prepare definitive designs and specifications prior to contract negotiation, firm fixed price contracts will be used. In some cases, however, there will be uncertainties regarding certain aspects of the scope of work. Contracts will be obtained on a firm fixed price basis for that portion of the work which is defined, and other types of contracts will be used for the remaining portions of work.

5.12 SOCIOECONOMIC AFFAIRS

5.12.1 Overview

Many of NWA's activities will affect the social and economic well-being of the State of Alaska, its cities, communities, and citizens. In particular, native communities and local life-styles along the pipeline right-of-way may be affected.

5.12.1 Overview (Continued)

NWA is working to maximize the positive socioeconomic effects of this project. Activities that will adversely affect the social and economic stability of an area will be counterbalanced by those that improve or restore socioeconomic equilibrium.

In many areas, project activities have the potential to strain the local infrastructure. This is especially true in communities that have no prior experience with a major construction project, such as those between Delta Junction and the Canadian border. NWA's efforts will strengthen the regional infrastructure in a manner which provides lasting benefits to the communities and the people of the State of Alaska.

NWA's socioeconomic program is primarily concerned with the interactions of the project with Alaskan society, rather than internal project operations. Because many of these interactions may have positive and negative effects simultaneously, close coordination with the State Pipeline Coordihator's Office will be necessary in planning impact mitigation measures.

NWA will focus its efforts on avoiding, minimizing, and counterbalancing adverse socioeconomic impacts. NWA's socioeconomic program will address the following:

- o Material and personnel movement demands on transportation infrastructure.
- o Public safety and law enforcement.
- o Health and social service facilities.
- o Opportunities for resident contractors and workers.
- o Orientation of workers.
- o Availability of market services and goods.
- Demands on housing, recreational, and educational facilities.

NWA's efforts will include:

- o Generating baseline socioeconomic data.
- o Projecting potential project impacts.

5.12.1 Overview (Continued)

- o Working with local communities to develop plans to minimize and counterbalance impacts.
- o Implementing these plans and programs where appropriate.
- o Monitoring the effectiveness of programs.

Additional detail on the scope of the socioeconomic program and its organization is contained in the Socioeconomic Plan.

5.12.2 Policies

NWA has established the following socioeconomic policies:

A high-level focal point has been established to permit contact with government agencies and local groups on socioeconomic issues. This focal point is the Socioeconomic Affairs staff, which will coordinate resolution of socioeconomic issues with other company and external organizations. This department will work closely with the State Pipeline Coordinator's Office and the OFI Socioeconomic Advisor.

Communities without recent major construction project experience will be given highest priority in NWA's socioeconomic efforts. These communities, such as those between Delta Junction and the Candian border, are expected to have the most difficulty absorbing the impacts of project construction.

NWA will provide timely information on project activities for impact planning and evaluation by government agencies and local communities. This information will include baseline studies, socioeconomic plans, and data from ongoing studies. Many potential socioeconomic problems may be avoided by public agencies, planning groups, and businesses if they have accurate and timely projections of project employment and schedules.

Temporary and permanent infrastructure will be developed in a manner which maximizes the residual value to local communities.

5.12.2 Policies (Continued)

NWA will encourage the use of existing government programs to accomplish socioeconomic objectives. NWA will work cooperatively with these organizations by providing essential information for their planning efforts. The company will not displace traditional government functions and responsibilities.

EC and subcontractor contracts will reflect the project's socioeconomic goals. Socioeconomic objectives and reportting requirements will be incorporated in these contracts.

PERMITS AND AUTHORIZATION TO PROCEED



FIGURE M-23

6.0 PROJECT CONTROL AND REPORTING

The systems established for project control and reporting will satisfy two major goals. First, data must be gathered to permit the management control of costs and schedules. Second, data must also be collected for FERC and tax reporting requirements, as well as for preparation of financial reports for the partnership and other investors. In this section, these two goals are distinguished as:

Cost and schedule control

Financial control

These goals are discussed below. Additional detail on project control and reporting procedures is contained in the Project Control and Monitoring Plan and the MIS Plan.

6.1 COST AND SCHEDULE CONTROL

6.1.1 Overview

The major activities required for cost and schedule control are:

- Defining work packages and assigning responsibilities.
- Establishing schedules, cost estimates, and budgets for work packages.
- Monitoring work accomplishment against schedules and estimates.
- o Controlling changes to schedules and estimates.
- o Field use of cost and schedule information.

These activities are described below.

6.1.1.1 Work Package Definition and Assignment - Individual tasks involved in the construction of the Alaska Segment will be grouped into work packages. Each work package will be assigned to an organization responsible for meeting schedule and cost objectives. The work breakdown structure (WBS) will show how these work packages fit together to form the entire project structure.

6.1.1.1 Work Package Definition and Assignment (Continued)

Work packages will be contracted to design, service, and execution contractors. These packages will represent the fundamental units for purposes of work authorization, planning, scheduling, cost estimating, and performance monitoring.

6.1.1.2 Schedules, Cost Estimates, and Budgets - The PMC will prepare schedules for all project work packages. At the highest level in the WBS, these schedules will identify major project milestones. At lower levels within the WBS, intermediate and detailed milestones will be identified. These schedules will be prepared at the lowest possible level and will define the sequence of work as well as the interfaces between performing organizations.

The Certification Cost Estimate (CCE) will be prepared and submitted as part of the filing for the Certificate of Public Convenience and Necessity. It will be reviewed by FERC to determine that the projected costs are reasonable. The CCE will help establish the Incentive Rate of Return (IROR). It will fix unit prices and establish a baseline for monitoring changes in the project scope.

Once the project design is completed, the final design estimate will be submitted to the OFI. Once established, the final design estimate will be changed only as a result of one or more of the following:

Government-caused delays.

Government-ordered changes.

Natural disasters.

Declared or undeclared war.

The baseline used for ongoing control of the project will change as better information on project costs becomes available. Initially, this baseline will be the CCE. When the final design estimate is approved, it will replace the CCE as control baseline.

Project budgeting will be based on the above described cost estimates. Budgets for fixed price contracts will be developed at the work package level. Once fixed, these budgets will remain constant for the life of the project and will only be altered based on contractual changes.

This combination of schedules, cost estimates, and budgets comprises the standards for measuring project progress.

6.1.1.3 Monitoring Work Accomplishment - Cost and schedule progress data will normally be collected at the work package level. In certain cases, project control may require reporting at the task level. Cost and progress data requirements will be specified to ECs in RFQs and subsequent contracts. Cost breakdowns will be required in enough detail to support FERC and tax reporting requirements as well as project control requirements. This data will also support quick and equitable negotiation of changes to fixed price contracts in the event this becomes necessary. The method of transmission, format of reports, cutoff dates for data collection, and other necessary reporting procedures will be specified to ECs in their contracts. Retroactive changes will not be made to recorded data, except for error corrections and accounting adjustments.

The reports that are based on collected data will also be structured around the WBS. Variances in cost, usage, and time will be monitored. When variances exceed a predetermined threshold, a variance analysis report will be prepared. This report will identify causes, define magnitude of impact, and outline corrective actions to be taken. When variances indicate that a significant overrun or underrun will occur, a revised estimate or forecast will be prepared.

6.1.1.4 Schedule and Cost Estimate Changes - All changes to cost estimates and schedules will be managed through a formal change control system. Any work conducted prior to the negotiation of a change will be assigned an interim budget and held within that budget until schedule changes are reflected in the contract.

6.1.1.5 Field Use of Cost and Schedule Control Information -Area managers will have an important impact on cost control and schedule progress, and it is crucial that these managers succeed in meeting their goals. Figure M-24 identifies the key indicators that will be available at the area manager level. To a large extent, these indicators are focused on identifying problems that could have an impact on progress and costs <u>before</u> an impact occurs. They are directed at the key tasks which must be accomplished to permit the EC to efficiently execute a fixed price contract. The typical areas of concern include:

- o Station and temporary facility construction progress.
- o Pipeline construction progress.
- o Permit and notice to proceed (NTP) status.

6.1.1.5 Field Use of Cost and Schedule Control Information (Continued)

- o Status of materials provided by NWA to the ECs.
- o EC manpower and equipment status.
- o Quality control and quality assurance.
- o Areas of environmental sensitivity.
- o Status of contract scope changes.
- o Cost information.

6.1.2 Policies

The following policies have been established for cost and schedule control systems:

Cost and schedule progress data will be collected in a format which satisfies requirements for both cost control and financial reporting. This will be done by providing coding in sufficient detail at the initial entry point.

Requirements to submit cost and schedule breakdowns will be incorporated in request for quotations and subsequent contracts. These requirements will provide standard formats and define submission schedules.

The PMC will manage the field collection of data for cost and schedule control as well as financial reporting. NWA will monitor and audit the data-collection process to verify accuracy.

6.2 FINANCIAL CONTROL

6.2.1 Overview

The data-collection systems that provide information for cost and schedule control also provide inputs for financial, FERC, and tax reporting. These reports require both cost and progress information. Costs will be aggregated based on the FERC's Uniform Code of Accounts. The initial input of cost and progress data will be coded in enough detail to derive information for both control and accounting objectives.

6.2.2 Policies

The following policies have been established for systems reporting information for financial control:

Financial reporting will be accomplished using cost and progress data collected by the PMC from ECs. This will require coding in enough detail to allow the development of financial reports as well as the reports of the cost and schedule control system.

Contractual relationships with the PMC and ECs will define requirements for submitting cost and progress data. Contracts will define the level of cost breakdown and the submission schedule. They will ensure that data is available for FERC and tax accounting.

TYPICAL KEY MANAGEMENT INDICATORS FOR AREA MANAGER				
Area of Concern	Frequency of Report	Typical Key Indicators		
Stations and temporary facility construction progress	Weekly	Summary of work accomplished in past week compared with work planned for week		
	Monthly	Summary of overall progress – total work completed to date compared to progress to date projected in plan		
Pipeline construction progress	Daily	Daily footage of: pipe welded/ tied in, ditch opened, stringing, pipe tested, skips		
	Weekly	Summary of work accomplished in the past week and overall progress compared to plan		
Permits and NTPs	Daily	Status on permits which are behind schedule and have the potential to disrupt the EC's achievement of cost or schedule goals		
Materials provided by NWA to EC	Daily	Status on materials which are behind schedule and have the potential to disrupt the EC's achievement of cost or schedule goals		

Area of Concern	Frequency of Report	Typical Key Indicators
EC manpower and equipment	Weekly	Head count and equipment count compared to contractor's plan, to permit early identification of contract performance problems
Quality control and quality assurance	Daily	Status of X-ray testing results
		Summary reports on all QC/QA tests and inspections conducted, with detailed information on tests and inspections failed
Environmental sensitivity	Daily	Report on any changes in environmental sensitivity and identification of key areas of sensitivity for new work
Contract scope changes and extra work orders	Daily	Reports on any deviations from plan which could require scope changes
		Status of all scope changes awaiting approval by NWA or acceptance by ECs
Cost	Weekly	Report on cost of construction progress compared to budgeted costs
	Monthly	Report on total facility or spread costs collected on an as-incurred basis. This would include a detailed breakout of construction, materials, and scope changes. The costs incurred in this period and costs to date are compared to budgeted costs.

EXHIBIT M (SECTION 7.0)

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ALASKA HIGHWAY PIPELINE PROJECT OPERATING AGREEMENT

ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

ALASKA SEGMENT OF THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM

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EXHIBIT A - ACCOUNTING PROCEDURE

OPERATING AGREEMENT

This Agreement dated this day of ______, 1979, by and between Alaskan Northwest Natural Gas Transportation Company, a general partnership and Northwest Alaskan Pipeline Company, a Delaware Corporation ("Operator").

RECITALS:

A. The Alaskan Northwest Natural Gas Transportation Company was formed pursuant to an agreement ("General Partnership Agreement") effective as of January 31, 1978 as successor to all rights, titles and interests of Alcan Pipeline Company as the Person designated by the Presidential Report and related regulatory proceedings and orders to construct and operate a natural gas pipeline system in Alaska pursuant to Section 7(a)(4)(B) of the Alaska Natural Gas Transportation Act of 1976.

B. Pursuant to Section 8.6 of the General Partnership Agreement, Operator has been designated to manage the design and construction of the Project and operation of the Line. Operator is willing and able to assume such responsibilities on the terms and conditions set forth below.

NOW THEREFORE, in consideration of the representations, covenants and premises hereinafter set forth the parties agree as follows: AGREEMENT:

ARTICLE I

DEFINITIONS

Section 1.01 - Definitions

As used in this Agreement, the definitions used in the General Partnership Agreement shall, except as specifically provided herein, have the same meanings in this Agreement. In addition, the following words and terms shall have the meanings set forth herein:

(a) The word "day" shall mean a period of twentyfour (24) consecutive hours commencing at 8:00 a.m. Alaska-Hawaii Time, except that appropriate adjustments shall be made during the days when a time change is made from Standard Time to Daylight Savings Time and vice versa.

(b) The word "month" shall mean a period of time beginning on the first day of a calendar month and ending at the same time on the first day of the next succeeding calendar month.

(c) The term "year" shall mean each twelve (12) month period beginning on the first day of a calendar
year and ending on the first day of the next calendar year, provided that the first year hereunder shall begin on January 31, 1978, and shall end on December 31 next following and further provided that the last

contract year shall end at the end of the term provided in Section 8.01, unless extended by mutual agreement between Partnership and Operator.

(d) The term "Alaskan gas" shall be that gas produced within the State of Alaska which is transported through the Line as part of the Project.

(e) The term "Accounting Procedure" shall mean the accounting procedure set forth in Exhibit "A" hereto.

(f) The term "party" shall mean Partnership or Operator and "Parties" shall mean both Partnership and Operator.

(g) The term "Partnership" shall mean the Alaskan Northwest Natural Gas Transportation Company and any successor entities thereto.

(h) The term "Line" shall mean the gas pipeline and related facilities to be owned and operated by the Partnership, which shall initially extend from the Prudhoe Bay area to an interconnection with the Canadian Pipeline on the Alaska-Canada border, and any extensions, expansion, additions, betterments or renewals thereof.
ARTICLE II

REPRESENTATIONS

Section 2.01 - Partnership's Representations

(a) Partnership represents that Operator shallhave all rights and obligations specified in Section 8of the General Partnership Agreement.

(b) Partnership shall cooperate with Operator, including reimbursing Operator on a timely basis for all reasonable costs, including overhead and administrative expenses, in order to facilitate the services to Partnership specified in the General Partnership Agreement and herein.

Section 2.02 - Operator's Representations

(a) Operator represents that in performing the responsibilities set forth in Article III, it shall carry out such responsibilities or shall cause contractors selected to carry out such responsibilities with the same degree of diligence and care that Operator would exercise if operating its own property in a sound, workmanlike and prudent manner and it shall comply, and shall require all contractors to comply, with all relevant laws, statutes, ordinances, safety codes, regulations and rules applicable to the Project.

(b) Operator represents that it shall comply with the provisions of the General Partnership Agreement applicable hereto, including the provisions related to the Project Management Contractor.

ARTICLE III

OBLIGATIONS OF OPERATOR

Section 3.01 - Operator's Responsibilities

Operator, subject to budget authorizations by the Board of Partners, shall:

(a) provide the day-to-day management supervision, operating and maintenance services, administrative liaison and related services to Partnership, including legal, accounting, engineering, planning, budgeting, technical services, insurance administration, tax services and regulatory matters;

(b) make reports to and consult with the Board of Partners in the form and at the times requested by the Board of Partners;

(c) except as otherwise provided by applicable governmental regulations, retain all charts, records, books of account, Partnership Tax Returns, plans, designs, studies and reports and other documents related to the design, construction, operation and maintenance of the Project for a period of at least three (3) years from the date of completion of the activity to which such records relate;

(d) except as delegated to the Project Management Contractor, purchase materials, equipment and supplies in the name of the Partnership necessary for the design, construction, operation and maintenance of the Line and sell or exchange such materials, equipment and supplies;

(e) except as delegated to the Project Management Contractor, purchase, option or otherwise acquire in the name of the Partnership rightsof-way, land in fee and permits necessary for construction, operation and maintenance of the Line; resist the perfection of any liens against Partnership property and, to the extent permitted by law, hold Partnership property free from all liens;

(f) review and advise Partnership regarding engineering plans and outlines for all necessary design of initial and subsequent improvements, additions or replacements of the Line;

(g) supervise and report regarding readingsof all measuring equipment required in connectionwith the Line;

(h) review the qualifications of and retain outside consultants, contractors and other services (as provided in the General Partnership Agreement the Project Management Contractor shall be approved and engaged by the Board of Partners);

(i) prepare and file all administrative formsor reports (including any regulatory filings,

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Partnership tax returns, safety reports, operating reports and any other reports required) with governmental and other agencies required for the construction and day-to-day operations of the Line; all reports in connection with emergency or unusual circumstances shall be made as expeditiously as reasonably possible;

(j) make immediate reports to Partnership of all unusual or significant occurrences in relation to the Line, regardless of whether or not such reports have been required pursuant to Subsection 3.01(b);

(k) make recommendations to Partnership as required by the General Partnership Agreement for the proposed budget required for the Line and operations in connection therewith for the succeeding calendar year or portion thereof;

(1) provide an adequate number of qualifiedsupervisory and professional and craft personnelto perform the obligations contemplated hereunder;

(m) require all contractors, vendors and suppliers, including the Project Management Contractor, to perform their services in connection with the Project in accordance with sound, prudent and workmanlike industry practices;

(n) have or provide custody of funds, notes,drafts, acceptances, commercial paper and other

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securities belonging to the Partnership; keep funds belonging to Partnership on deposit in one or more banking institutions as approved by the Board of Partners; and, subject to direction by the Board of Partners, invest available funds in the manner provided for by the Board of Partners, dispurse such funds, and keep appropriate records in connection with all the above transactions.

(o) meet the standard of care set forth inSubsection 2.02(a);

Section 3.02 - Operator's and Other's Records

All of the books, records, charts and other documents prepared and retained by Operator in connection with the obligations set forth in Section 3.01 shall, as provided in Section 5.05, be made available during normal business hours to Partnership or any Partner or their respective representatives to permit them to audit and verify the accuracy of any statement, billing, charge or computation made by Operator in connection with this Agreement. Operator shall obtain similar rights from contractors, consultants and suppliers, including the Project Management Contractor, performing in connection with the Project and, to the extent reasonably possible, obtain similar rights for the Partnership and Partners.

Section 3.03 - Operator's Indemnity

Operator shall indemnify and hold Partnership, its employees or agents harmless from and against: (a) all actions or failures to act by
Operator which are not in accordance with the
terms of this Agreement or an express direction
by Partnership;

(b) claims for non-payment of any and all contributions, withholding deductions or taxes measured by the wages, salaries or compensation paid to persons employed by Operator in connection herewith.

Section 3.04 - Partnership's Indemnity

(a) The Partnership shall indemnify and save harmless the initial Operator against all actions, claims, demands, costs and liabilities arising out of the acts (or failure to act) of Operator in good faith within the scope of its authority in the course of the Partnership's business and Operator shall not be liable for any obligations, liabilities, or commitments incurred by or on behalf of the Partnership as a result of any such acts (or failure to act). Operator shall not be indemnified for its willful misconduct.

(b) Any and all claims, damages or causes of action in favor of anyone other than the Partnership arising out of the construction, operation, maintenance, upkeep, repair, replacement, improvement and expansion of the Line which are not covered by insurance as per Section 3.06 shall be settled or litigated and defended by Operator in accordance with its best judgment and discretion when (i) the amount involved is less than a ceiling amount to be established by the Executive Committee; (ii) no injunctive or similar relief is sought; and (iii) no criminal sanction is sought; otherwise, such decision shall be made by the Executive Committee, and any settlement or defense thereof shall be controlled by the Executive Committee. Section 3.05 - Phases

There shall be three phases to the work contemplated hereunder:

(a) <u>Design Phase</u> - commencing on the execution of this Agreement and continuing until the date of acceptance of the FERC final Certificate.

(b) <u>Construction Phase</u> - commencing on the date of acceptance of the FERC final certificate and continuing until the In-Service Date of the Line.

(c) <u>Operation Phase</u> - commencing on the In-Service Date of the Line and continuing throughout the remainder of the term provided in Article VIII.

Section 3.06 - Insurance

During each phase of the work hereunder:

(a) Operator shall, subject to the approval of the Executive Committee, carry and maintain or cause

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any contractors, subcontractors or consultants to maintain such insurance as is adequate (i) to protect the Partnership, (ii) secure the approval of the Federal Inspector, and (iii) satisfy any other requirement of law.

(b) Operator may carry and maintain in force for its benefit insurance of the type and in the amount which Operator in its sole opinion deems necessary to protect it from loss resulting from any claims, damages, causes of action or legal liability in favor of Partnership arising out of, in connection with, or as an incident to any act or omission of Operator, its officers, agents or employees, in carrying out its responsibilities under this Agreement.

(c) Such insurance shall be a reimbursable cost pursuant to Section 5.01(b).

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ARTICLE IV

EMPLOYEES, CONSULTANTS AND SUBCONTRACTORS

Section 4.01 - Operator's Employees, Consultants and Subcontractors

Operator shall employ or retain and have supervision over the persons (including consultants and professional service or other organizations) required by Operator to perform its duties and responsibilities hereunder in an efficient and economically prudent manner. Operator shall pay all reasonable expenses in connection therewith, including compensation, salaries and wages and, if applicable, expenses, social security taxes, workers' compensation insurance, retirement and insurance benefits and other such expenses. Subject to the provisions of Section 8.5 of the General Partnership Agreement (Compensation Committee), the compensation for Operator's employees shall be determined by Operator. All authorized expenses pursuant to this Section shall be reimbursed to Operator by the Partnership as provided in the Accounting Procedure.

Section 4.02 - Standards for Employees

All employees, workmen, foremen and supervisors ("employees") engaged or directed by Operator to perform Operator's obligations under this Agreement shall be duly qualified and experienced to perform such obligations. Operator shall at all times enforce strict discipline and maintain good order among such employees, and shall require such employees to comply with all relevant laws, statutes,

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ordinances, safety codes, regulations and rules applicable to the Project.

Section 4.03 - Non-Discrimination

In performing under this Agreement, Operator will not discriminate against any employee or applicant for employment because of race, creed, color, religion, sex, national origin, age or handicap, and will comply with all provisions of Executive Order 11246 of September 24, 1965.

Section 4.04 - Consultants and Subcontractors

The provisions of Sections 4.02 and 4.03 shall be applicable to any contractors, consultants and/or subcontractors retained in connection herewith, including the Project Management Contractor.

ARTICLE V

FINANCIAL, ACCOUNTING AND BILLING PRACTICES Section 5.01 - Accounting and Compensation

(a) Operator shall keep a full and complete account of all costs, expenses and expenditures incurred by it in connection with each Phase referred to in Section 3.05 in connection with its obligations hereunder in the manner set forth in the Accounting Procedure.

(b) Operator shall be reimbursed by Partnership for all reasonable and proper costs, expenses and expenditures paid by it for Partnership at the rate and in the manner set forth in the Accounting Procedure; provided, however, that costs incurred by the Operator under paragraph 3.03 shall not be reimbursed by the Partnership. It is the intent of the Parties that Operator shall carry out its services hereunder on a fully reimbursed basis without profit or loss. To the extent that a deviation from this standard occurs, appropriate adjustments will promptly be made.

Section 5.02 - Budgets

Consistent with the provisions of Section 4.2 of the General Partnership Agreement, the Operator shall submit proposed budgets, including contractual commitments which will accrue if the Project is suspended, to the Board of

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Partners on or before June 30, 1978, and November 1, 1978, as to the items Operator believes should be included in the budgets for the periods specified in Sections 4.2.3 and 4.2.4 of the General Partnership Agreement. Thereafter, budgets, including contractual commitments which will accrue if the Project is suspended, shall be submitted to the Board of Partners on an annual basis. On or before November 1, 1979, and on or before each November 1 thereafter, Operator shall prepare and submit for approval of the Board of Partners an estimate of capital expenditures and operating income and expenses which Operator anticipates for the ensuing calendar year. Except as the Board of Partners may otherwise direct, the budget approved by the Partnership and then in effect shall constitute authorization of Operator to incur the expenditures contained in such budget. Section 5.03 - Disputed Charges

Partnership may, within the time provided in the Accounting Procedure, take written exception to any bill or statement rendered by Operator for any expenditure or any part thereof, on the ground that the same was not a reasonable, authorized, and proper cost incurred by Operator in connection with the design, construction, operation, maintenance, upkeep or repair of the Line. Partnership shall nevertheless pay in full when due the amount of all statements submitted by Operator. Such payment shall not be deemed a waiver of the right of Partnership to recoup any

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contested portion of any bill or statement. However, if the amount as to which such written exception is taken or any part thereof is ultimately determined by Partnership not to be a reasonable, authorized, and proper expense incurred by Operator in connection with the design, construction, operation, maintenance, upkeep or repair of the Line, such amount or portion thereof (as the case may be) shall be refunded by Operator to Partnership together with interest thereon at a rate (which in no event shall be higher than the maximum rate permitted by applicable law) equal to the prime rate charged by the Bank of America, N.T. & S.A., San Francisco, California from time to time to responsible commercial and industrial borrowers during the period from the date of payment by Partnership to the date of refund by Operator. Section 5.04 - Rate Reviews

Operator shall review from time-to-time the rates and fees charged for transportation services and recommend to Partnership revision in such rates and fees as necessary to reflect increased or decreased costs or other changes in the conditions of service in order to assure that all costs are reflected in the tariffs of Partnership.

Section 5.05 - Audit

In addition to the audit responsibilities assigned by the Partnership Agreement to the Operator and the Audit Committee, Partnership or its designated representatives (including representatives from each Partner), after fifteen (15) days'

notice in writing to Operator, shall have the right during normal business hours to audit, at its own expense, all books and records of Operator as well as the relevant books of account of Operator's contractors relating to the construction and operation of the Line. Such audits shall not be commenced more often than twice each calendar year. Partnership shall have two (2) years after the close of a calendar year in which to make an audit of Operator's records for such calendar year; provided, however, that any audits relating to construction costs may be made up to twentyfour (24) months after the completion of the construction phase. Absent fraud or intentional concealment or misrepresentation by Operator or its employees, and except for any adjustments which may arise from FERC compliance audits, Operator shall neither be required nor permitted to adjust any item unless a claim therefor is presented or adjustment is initiated within two (2) years after the close of the calendar year in which the statement therefor is rendered, and in the absence of such timely claims or adjustments, the bills and statements rendered shall be conclusively established as correct; provided, however, this shall not prevent adjustment resulting from physical inventory of the Line and other Project property or audit adjustments relating to construction costs incurred during the construction phase.

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ARTICLE VI

INDEPENDENT CONTRACTOR

Section 6.01 - Independent Contractor

(a) In performing services pursuant to this Agreement, Operator shall be an independent contractor and not an employee, agent or servant of Partnership and this Agreement does not create any partnership or joint venture between the Partnership and the Operator.

(b) Operator shall comply with all relevant laws, statutes, ordinances, safety codes, regulations and rules applicable to the Project.

ARTICLE VII

INTELLECTUAL PROPERTY

Section 7.01 - Inventions and Copyrights

Any (i) inventions, whether patentable or not, developed or invented or (ii) copyrightable material, developed by Operator or its employees during the performance of services under this Agreement shall, unless otherwise directed, be assigned to Partnership, which shall have the exclusive right to the exploitation thereof.

Section 7.02 - Confidentiality

Because the information and knowledge gained during the performance of services hereunder may consist of valuable proprietary information, the misuse or disclosure of which could cause substantial damage to Partnership, any and all information obtained by Operator in performance of its obligations hereunder shall be neld in strict confidence by Operator, its employees or agents except as needed to comply with the purposes of this Agreement. Any contracts entered into by Operator related to its obligations under this Agreement shall contain a provision which similarly restricts the use and disclosure of such information.

ARTICLE VIII

TERM

Section 8.01 - Term

This Agreement shall be effective as of January 31, 1978 and subject to the provisions of the General Partnership Agreement, shall continue for a term of twenty-five (25) years after the In-Service Date for the Line, and thereafter on a year-to-year basis unless terminated on six (6) months' prior written notice by either party hereto.

Section 8.02 - Upon Termination

Termination of this Agreement shall not relieve either party from paying amounts of money due hereunder which (a) were due prior to or (b) become due after or as a result of such termination.

ARTICLE IX

ACCOUNTING AND TAXES

Section 9.01 - Consistent with General Partnership Agreement

The accounting and tax service provided by Operator shall be consistent with the applicable provisions of Section 7 of the General Partnership Agreement which are incorporated by reference herein as if set forth in full. Matters of tax policy for the Partnership shall be the responsibility of, and ultimately determined by the Board of Partners.

ARTICLE X

LAW OF THE CONTRACT AND ARBITRATION

Section 10.01 - Law of the Contract

This Agreement and all other agreements relating thereto shall be construed and interpreted under the laws of the State of New York.

Section 10.02 - Arbitration

(a) In the event that the parties are unable to agree on any of the matters set forth herein, except as provided in Section 5.03, either Partnership or Operator may upon written notice call for submission of such matter to arbitration. The party requesting arbitration shall set forth in such notice in adequate detail the issues to be arbitrated, and within ten (10) days from the receipt of such notice, the other party may set forth in adequate detail additional related issues to be arbitrated. If arbitration is invoked by either party, the decision of the arbitrators shall be final and binding upon all parties.

(b) Such binding arbitration shall be conducted by a person or entity knowledgeable and experienced in pipeline design, construction and operations matters. In the event the parties are unable to agree upon such person or entity, they shall then each select a person or entity having the qualifications set forth

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above, and such persons or entities selected shall mutually agree upon a similarly qualified.third person or entity to complete the arbitration panel. In the event that the persons selected by the parties are unable to agree on a third member of the panel within sixty (60) days after their selection, such person shall be designated by the American Arbitration Association or such other person the parties mutually agree upon. Upon final selection of the entire panel, such panel shall, as expeditiously as possible, render a decision on the matter submitted for arbitration.

(c) Upon the determination of any such dispute, the arbitrators shall bill the costs attributable to such binding arbitration to the party whose position they determine is farthest away from the actual decision rendered; provided, however, that the arbitrators shall be empowered to apportion such costs between the parties if they deem it appropriate.

(d) It is the intent of the parties that the matters agreed upon to be arbitrated be decided as set forth herein and they shall not seek to have this Article X rendered unenforceable or to have such matter decided in any other way.

ARTICLE XI

FORCE MAJEURE

Section 11.01 - Effect of Force Majeure

In the event that either Partnership or Operator is rendered unable, by reason of an event of force majeure, to perform, wholly or in part, any obligation or commitment set forth in this contract, then upon such party's giving notice and full particulars of such event as soon as practicable after the occurrence thereof, the obligations of both parties, except for unpaid financial obligations arising prior to such event of force majeure, shall be suspended to the extent and for the period of such force majeure condition.

Section 11.02 - Nature of Force Majeure

The term "force majeure" as employed in this Agreement shall mean acts of God, strikes, lockouts or industrial disputes or disturbances, civil disturbances, arrests and restraint from rulers of people, interruptions by government or court orders, present and future valid orders, decisions or rulings of any governmental entity having proper jurisdiction, acts of the public enemy, wars, riots, blockades, insurrections, inability to secure labor or inability to secure materials, including inability to secure materials by reason of allocations promulgated by authorized governmental agencies, epidemics, landslides, lightning, earthquakes, fire, storms, floods, washouts, inclement weather which necessitates extraordinary measures and expense to construct facilities and/or maintain operations, explosions, breakage or accident to machinery or lines of pipe, freezing of wells or pipelines, inability to obtain or delays in obtaining easements or rights-of-way, the making of repairs or alterations to wells, pipelines or plants, partial or entire failure of gas supply or any other cause, whether of the kind herein enumerated or otherwise, not reasonably within the control of the party claiming force majeure.

Section 11.03 - Non-Force Majeure Situations

Neither Operator nor Partnership shall be entitled to the benefit of the provisions of Section 11.01 under the following circumstances:

(a) To the extent that the failure was caused by the party claiming suspension having failed to remedy the condition by taking all reasonable acts, short of litigation, if such remedy requires litigation, and having failed to resume performance of such commitments or obligations with reasonable dispatch;

(b) If the failure was caused by lack of funds, or with respect to the payment of any amount or amounts then due hereunder;

(c) To the extent that the failure was caused or contributed to by the negligence of Operator or the Partnership and such negligence shall be the cause of such failure.

Section 11.04 - Resumption of Normal Performance

Should there be an event of force majeure affecting performance hereunder, such events shall be remedied with all reasonable dispatch to insure resumption of normal performance.

Section 11.05 - Strikes and Lockouts

Settlement of strikes and lockouts shall be entirely within the discretion of the party affected, and the requirement in Section 11.04 that any event of force majeure shall be remedied with all reasonable dispatch shall not require the settlement of strikes or lockouts by acceding to the demands of the parties directly or indirectly involved in such strikes or lockouts when such course is inadvisable in the discretion of the party having such difficulty.

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ARTICLE XII

MISCELLANEOUS

Section 12.01 - Amendment

This Agreement shall only be amended by an instrument in writing executed by both parties.

Section 12.02 - Waivers

A waiver by a party at any time of its rights with respect to a default under this Agreement, or with respect to any other matter in connection with this Agreement, shall not be deemed a waiver with respect to any other or subsequent default or matter.

Section 12.03 - Severability

If any provision of this Agreement shall be invalid or unenforceable to any extent, the remainder of this Agreement shall not be affected thereby and shall be enforced to the greatest extent permitted by law.

Section 12.04 - Governmental Bodies

This Agreement is subject to all valid orders, rules and regulations of any governmental body having jurisdiction over the parties hereto, or this Agreement.

Section 12.05 - Entirety

In addition to the obligations of the Operator set forth in Article III, this Agreement is also intended to include as an obligation of the Operator any duty, responsibility, or requirement assigned to the Operator by the terms of the Partnership Agreement, including section 8.6 thereof, not specifically detailed in Article III herein. This Agreement and the Partnership Agreement contain the entire agreement between the parties and except as stated herein there are no oral promises, agreements or warranties affecting it.

Section 12.06 - Recitals

For the purpose of interpreting this Agreement, the Recitals shall be considered incorporated herein as if set forth in full.

Section 12.07 - Remedies Cumulative

Remedies provided under the provisions of this Agreement shall be cumulative and, except as to the agreement for binding arbitration contained in Article X hereof, shall be in addition to the remedies provided by law or in equity.

Section 12.08 - Conflicts

In the event there is any conflict between this Agreement and any schedule or subsequent agreement referred to herein, the provisions hereof shall be deemed controlling, except in the event of a conflict with the Partnership Agreement, in which event the Partnership Agreement shall be deemed controlling.

Section 12.09 - Reporting

For any reporting or approval purposes, the Executive Committee of the Partnership shall be considered as having the authority in all instances to act on behalf of the Partnership. Accordingly, unless otherwise advised by the Partnership, Operator shall report to and coordinate its efforts to satisfy its obligations with the Executive Committee. Operator shall also report to the Board of Partners as provided in Section 8.6.8 of the General Partnership Agreement.

Section 12.10 - Operating and Maintenance Plan

Operator shall submit to Partnership for approval an operating and maintenance plan for the Line, as required by the Minimum Federal Safety Standards, Part 192, of the Department of Transportation.

Section 12.11 - Operator's Office

Operator may select the location of its office or offices to perform its obligation hereunder.

Section 12.12 - Attorneys' Fees

Should any litigation be commenced between the parties concerning any provision of this Agreement or the rights and duties hereunder, the party prevailing in such litigation shall be entitled, in addition to such other relief as may be granted in such proceeding, to a reasonable sum as and for their attorneys' fees in such litigation, which sum shall be determined in such litigation or in a separate action for such purpose.

Section 12.13 - Counterpart Execution

This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together constitute one and the same instrument.

ARTICLE XIII

NOTICES

Section 13.01 - Notices

Unless herein provided to the contrary, any notice called for in this Agreement shall be in writing and shall be considered as having been given if delivered personally or by mail or telegraph with all postage or charges prepaid, to either Partnership or Operator at the places designated. Routine communication, including monthly statements and payments shall be considered as duly delivered when mailed by ordinary mail. Normal operating instructions can be made by telephone. Unless changed, the addresses of the parties are as follows:

"OPERATOR"

NORTHWEST ALASKAN PIPELINE COMPANY 315 East Second Street, South Salt Lake City, Utah 84111

"PARTNERSHIP"

ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

Any notice given to Partnership shall be promptly transmitted by it to each member of the Executive Committee. - 30 -

ARTICLE XIV

ASSIGNMENT

Section 14.01 - Assignability

As to the assignment of this Agreement:

(a) This Agreement shall not be assigned by eitherPartnership or Operator without the written consent of the other.

(b) Consent to assignment hereunder shall not be unreasonably withheld by either party hereto.

Section 14.02 - Successors and Assigns

This Agreement and all of the obligations and rights herein established shall extend to and be binding upon and shall inure to the benefit of the respective successors and assigns of the respective parties hereto.

Section 14.03 - Effective Date

Any assignment hereunder shall be effective on the first day of the month following the month during which the assignment is completed.

ATTEST:

NORTHWEST ALASKAN PIPELINE COMPANY

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ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

By each of its partners:

NORTHERN ARCTIC GAS COMPANY

ATTEST:

Ву_____

ATTEST:

ATTEST:

NORTHWEST ALASKAN PIPELINE COMPANY

By

PAN ALASKAN GAS COMPANY

Ву_____

CALASKA ENERGY COMPANY

ATTEST:

By____

ATTEST:

NORTHWEST ALASKAN PIPELINE COMPANY

ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

By each of its partners: NORTHERN ARCTIC GAS COMPANY

Bv President

NORTHWEST ALASKAN PIPELINE COMPANY

By

PAN ALASKAN GAS COMPANY

By____

CALASKA ENERGY COMPANY

By____

ATTEST:

ATTEST:

ATTEST:

ATTEST:

ATTEST:

NORTHWEST ALASKAN PIPELINE COMPANY

ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

By each of its partners:

NORTHERN ARCTIC GAS COMPANY

Ву

ATTEST:

ATTEST:

NORTHWEST ALASKAN PIPELINE COMPANY

Ву_____

ATTEST:

Assistant Secretary, J. T. Noel ATTEST: PAN ALASKAN GAS COMPANY

By

K. E. Kalen, President

CALASKA ENERGY COMPANY

By

ATTEST:

NORTHWEST ALASKAN PIPELINE COMPANY

ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

By each of its partners:

NORTHERN ARCTIC GAS COMPANY

Ву____

NORTHWEST ALASKAN PIPELINE COMPANY

By____

ATTEST:

PAN ALASKAN GAS COMPANY

Ву____

ATTEST:

saylor

CALASKA ENERGY COMPANY

Chairman of the Esard By

ATTEST:

ATTEST:

Assistant Secretary

ATTEST:

PACIFIC INTERSTATE TRANSMISSION COMPANY (ARCTIC) By 77 au President

UNITED ALASKA FUELS CORPORATION

By____

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ATTEST:

PACIFIC INTERSTATE TRANSMISSION COMPANY (ARCTIC)

Ву_____

ATTEST:

in the it is an

UNITED ALASKA FUELS CORPORATION

- ... 12, 71 By___

EXHIBIT A

TO

OPERATING AGREEMENT

ACCOUNTING PROCEDURE

ARTICLE I

General Provisions

1.01 Statements and Billings. Operator may bill Partnership on the first day of each month for the estimated costs and expenses for the month and any adjustment which may be necessary to correct prior estimated billings to actual. Such bills will be summarized by appropriate classifications indicative of the nature thereof.

1.02 Payment by Partnership. Partnership shall pay all bills presented as provided in the Operating Agreement on or before the 15th day after the billing date. If payment is not made within such time, the unpaid balance shall bear interest until paid at a rate (which in no event shall be higher than the maximum rate or rates permitted by applicable law) equal to the prime rate charged by the Bank of America N.T. & S.A., San Francisco, California from time to time to responsible commercial and industrial borrowers; provided, however, that if employees of Operator are responsible for writing Partnership's checks and Partnership has sufficient funds to make payment, no interest charge shall be imposed for late payment. Payment by or on behalf of Partnership shall not be deemed a waiver of the right to recoup any amount in question.

1.03 Adjustments. Except for any adjustments which may arise from FERC Compliance Audits, payment of any such bills shall not prejudice the right of Partnership to protest or question the correctness thereof; provided, however, all bills and statements rendered to Partnership by Operator during any calendar year shall conclusively be presumed to be true and correct after 24 months following the end of any such calendar year, unless prior to the end of said 24-month period Partnership takes written exception thereto and makes claim on Operator for adjustment; provided, however, this shall not prevent adjustment resulting from physical inventory of the Line and other Project property or that any adjustments relating to construction costs may be made up to 24 months after the completion of the construction phase. No adjustment favorable to Operator shall be made unless it is made within the same prescribed period.

1.04 <u>Financial Records</u>. Operator shall maintain accurate books and records in accordance with the Federal Energy Regulatory Commission's Uniform System of Accounts for Class A and B natural gas companies or any successor system thereto covering all of Operator's actions under this Operating Agreement.

ARTICLE II

Capital Items and Construction Costs

Except for items included in a previously approved budget, prior to the acquisition of any property, real or personal, costing more than a ceiling amount to be established by the Executive Committee in the name or on behalf of the Partnership which under the accounting rules and regulations, if any, at the time prescribed by the regulatory body or bodies under the jurisdiction of which the Partnership is at the time operating, might be capitalized, Operator shall prepare and submit to Partnership a forecast of the cost of all such property. Upon approval of such forecast by Partnership, Operator shall have authority to purchase such property in Partnership's name or in Operator's name for the benefit of Partnership without further approval or action by Partnership. To the extent Operator owns property necessary or desirable for the operation and maintenance of the Line which (i) under the accounting rules and regulations, if any, at the time prescribed by the regulatory body or bodies under the jurisdiction of which the Partnership is at the time operating, might be capitalized, (ii) Operator in its sole discretion is willing to transfer for consideration to Partnership, and (iii) can be transferred by Operator to Partnership free and clear of all prior liens and encumbrances, Operator, if approved by Partnership, may so transfer such property to Partnership and charge Partnership the net book value thereof as reflected on the books of Operator on the date of transfer.

ARTICLE III

Costs, Expenses and Expenditures

Subject to the limitations hereinafter prescribed and the provisions of the Operating Agreement to which this Accounting Procedure is an exhibit, Operator shall charge Partnership for all costs and expenses incurred by Operator (except those costs incurred under paragraph 3.03 of the

- 2 -
Operating Agreement) in connection with the administration, planning, accounting, design, construction, operation, maintenance, upkeep, or abandonment of the Line (hereinafter collectively referred to as "Operation of the Line"), including but not limited to the following items:

3.01 Rentals. All rentals paid by Operator.

3.02 Labor Costs.

(a) Salaries and wages of Operator's employees directly engaged in connection with the Operation of the Line and, in addition, amounts paid as salaries and wages of others temporarily employed in connection therewith. Operator's cost of holiday, vacation, sickness, jury service and other fringe benefits and customary allowances paid to persons whose salaries and wages are chargeable under this paragraph (a).

(b) Expenditures or contributions made pursuant to assessments imposed by governmental authority which are applicable to salaries, wages and costs chargeable under paragraph (a) above. The reasonable cost of plans for employees' group life insurance, hospitalization, disability, pension, retirement, savings and other benefit plans, applicable to labor costs chargeable under paragraph (a) above.

3.03 <u>Reimbursable Expenses of Employees</u>. Reasonable personal expenses of employees whose salaries and wages are chargeable under section 3.02(a) hereof. As used herein, the term "personal expenses" shall mean the usual out-ofpocket expenditures incurred by employees in the performance of their duties and for which such employees are reimbursed. Operator shall maintain documentation for such expenses in accordance with the standards of the Internal Revenue Service.

3.04 <u>Material, Equipment and Supplies</u>. It is contemplated that all material, equipment and supplies will be owned by the Partnership and purchased or furnished for its account. So far as is reasonably practical and consistent with efficient and economical operation, only such material shall be obtained for the Line as may be required for immediate use, and the accumulation of surplus stock shall be avoided. To the extent reasonably possible, Operator shall take advantage of discounts available by early payments and pass such benefits on to the Partnership. Material, equipment and supplies furnished by Operator, if any, shall be priced at cost plus carrying costs to be established by Operator based on actual experience.

3.05 <u>Transportation</u>. Transportation of employees, equipment, material and supplies necessary for the Operation of the Line. It is anticipated that all transportation equipment will be owned by the Partnership; provided, however, any automobiles, airplanes and trucks owned or obtained from Operator's parent or affiliates by Operator and approved for use for the Operation of the Line will be billed to Partnership at reasonable rates based on Operator's actual costs.

3.06 Services.

(a) The cost of contract services and utilities procured from outside sources.

(b) Use and services of vehicles, equipment and facilities furnished by Operator as provided in Section 3.05 hereof.

3.07 Legal Expenses and Claims. All costs and expenses of handling, investigating and settling litigation or claims arising by reason of the Operation of the Line or necessary to protect or recover any Line property, including, but not limited to, attorney's fees, court cost, cost of investigation or procuring evidence and any judgments paid or amounts paid in settlement or satisfaction of any such litigation or claims. Operator shall credit Partnership for judgments received or amounts received in settlement of litigation, with respect to any claim asserted on behalf of Partnership.

3.08 <u>Taxes</u>. All taxes (except those measured by income) of every kind and nature assessed or levied upon or incurred in connection with the Operation of the Line or on the Line or other property of the Partnership and which taxes have been paid by the Operator for the benefit of Partnership, including charges for late payment arising from extensions of the time for filing which is caused by Partnership.

3.09 Insurance. Net of any returns, refunds, or dividends, all premiums paid and expenses incurred for insurance required to be carried under the Operating Agreement for the benefit of Operator and Partnership. 3.10 <u>Permits, Licenses and Bond</u>. Cost of permits, licenses and bond premiums necessary in the performance of Operator's duties.

3.11 Administrative and General Expense. All administrative and general expenditures, including salaries and related benefits and expenses of personnel other than those referred to in Section 3.02, who render services to Operator, including, but not limited to, Accounting, Administative, Public Relations, Personnel, Purchasing, Legal and Treasury, will be charged on the basis of costs incurred. Operator shall, subject to the provisions of the General Partnership Agreement, also bill such administrative and general expenditures incurred by its parent or affiliates (majority-owned subsidiaries of Northwest Energy Company) in connection with the Operation of the Line as are approved by the Executive Committee.

ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY

ALASKA SEGMENT OF THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM

PMC ORGANIZATION

EXHIBIT M (SECTION 8.0)

8.0 PMC ORGANIZATION

The PMC will be responsible for all design and construction activity, whether performed internally or by other contractors. The PMC's objective is to provide the line management personnel, the support teams, and the management tools needed to direct others in the achievement of the basic project objectives. Thus the PMC will provide line management functions for the engineering and construction effort and for the quality program, will implement cost and schedule controls, and will procure all major materials and equipment for NWA. The PMC will also design the compressor and meter stations, using teams specializing in these types of facilities. Pipeline design will be performed by a joint venture contractor specializing in pipeline and civil designs.

PMC personnel are organized under a Project Director, who will have sole responsibility for project quality, cost, and schedule performance. The Project Director's primary interface will be with NWA's Senior Vice President of Engineering and Construction. He will also be responsible to PMC corporate management for project performance. The PMC team and key NWA personnel will be based in Irvine, California.

During the preconstruction phase of the project, the Project Director will be supported by legal counsel and four line managers: Director, Administration; Director, Project Operations; Director, Alaskan Operations; and Director, Quality Compliance (refer to Figure M-25). This group, called the "Project Directorate," will interface closely with NWA counterparts in developing objectives, policy, systems, and procedural guidelines for all aspects of the work.

The Directorate is expected to relocate to Fairbanks early in 1983, as full construction phase activities commence. However, the Director, Project Operations will continue to be based in Irvine to support the construction effort. The Project Directorate will be expanded to include a Director, Project Controls in Alaska who will guide the expanded cost and schedule control operations (Figure M-26). With this exception, the structural composition of the Directorate organization will remain unchanged during the transition from design to construction operations and the relocation of the Directorate.

8.1 DIRECTORATE

The Project Director will delegate portions of his authority to each director for implementation and will rely on legal counsel for advice to the directorate team in all policy areas. Authority will be delegated in the following areas:

- o Primary engineering and procurement authority will be delegated to the Director, Project Operations.
- Construction authority will be assigned to the Director, Alaskan Operations.
- Budgeting, forecasting, and reporting of cost and time factors will be delegated to the Director, Project Controls.
- The Director, Administration will be responsible for historical cost data, billings, payments, and audits; for cash and risk management and taxes; for the supply and training of personnel; for affirmative action programs; for management records and systems; and for project-wide procedure formalization.
- o The Director, Quality Compliance will be responsible for the quality of all activities related to engineering, procurement, and construction.

8.2 ORGANIZATIONAL PHILOSOPHY

The PMC organizational approach and charts generally emphasize team compositions and authority, using solid lines to indicate day-to-day functional relationships. Administrative lines, when shown, are dashed or dotted, but are generally omitted for simplicity. However, each group and discipline has these ties to higher levels for policy, personnel administration, and work performance standards.

The PMC organizational philosophy also requires that PMC management teams support each contractor and work location with appropriate personnel and skills to provide the required on-the-spot decisions and approvals. This authority will be delegated by levels, established by permit day-to-day operational response but requiring exception procedures if local decisions could influence other teams and activities.

All project operations are subject to financial and quality reviews and checks and balances. These are obtained through

8.2 ORGANIZATIONAL PHILOSOPHY (Continued)

organizational alignments and procedures and are examined through sampling techniques. PMC and project policy does not permit an individual to authorize any expenditure related to his own betterment. In addition, project procedures will require step-by-step separation of needs identification, commitment recommendations, and invoice approvals within the contracting and procurement cycles.

Finally, all groups will operate within a controls system which supports their needs for data and comparative performance information and also reports to others by exception, or in detail, when a group or work element deviates from plan.

8.3 PRECONSTRUCTION, TRANSITION, AND CONSTRUCTION PHASES

The PMC project effort will blend smoothly from the preconstruction phase, through a transitional phase, and then into the construction phase. Most of the work will be at Irvine during the preconstruction period, with the emphasis shifting to Alaska as the job progresses. The PMC organization will be structured so that this transition can be effected with only moderate changes in the organizational structure as the major activity shifts from Irvine to Alaska.

During the preconstruction phase of the work, the PMC will assist NWA in management of field programs for design criteria development, initial designs and estimates, planning, and FERC Filing development. This phase will progress into detailed designs, final requests for quotations, detailed procedure development, procurement, final planning, and front end construction work.

Work in Alaska during the preconstruction phase will focus on field programs for final data development, installation of temporary facilities, refurbishing of facilities from Alyeska operations, initial civil work and site preparations, and installation of the communications network.

The preconstruction operations in Irvine, under the Director, Alaskan Operations, will provide for a General Administrative Manager; Construction Manager, Pipeline; Construction Manager, Facilities; and Construction Services Manager, each with a supporting staff.

8.3 PRECONSTRUCTION, TRANSITION, AND CONSTRUCTION PHASES (Continued)

The organization chart in Figure M-27 shows the structure of the Alaskan Operations organization based in Irvine during the preconstruction phase of the project. The duties of these groups include planning for the construction phase, developing the procedures to be followed, and assisting the project Design, Controls, Procurement, Contracting, and Quality Compliance groups. The refurbishing and reestablishment of existing pipeline and station camps to support the Alaskan construction activity will be planned and designed by a team under the direction of a Temporary Facilities Project Manager. Like the Irvine-based work, all of the operations carried out in Alaska during this preconstruction phase will be under the general supervision of the Director, Alaskan Operations, based in Irvine.

The organization in Alaska supporting Alaskan preconstruction operations will be flexible enough to accommodate varying levels of activity, yet be able to smoothly blend into the organization arriving from Irvine for the construction phase. Position and reporting responsibilities for the preconstruction organization have been developed to closely match the construction organization. One key lead position, Alaskan Operations Manager, has been established. A11 positions in Alaska will be responsible to the Alaskan Operations Manager for day-to-day activity and to their department managers in Irvine for policy and procedure. The organization chart in Figure M-28 shows the Fairbanks-based Alaskan Operations organization during the preconstruction phase of the project.

The PMC Project Operations outside of Alaska are under the supervision of another member of the Directorate -- the Director, Project Operations. Reporting to the Director, Project Operations are five managers who supervise Project Controls, Environmental Engineering, Contracts Administration, Engineering Operations, and Procurement. The structuring of these positions is shown in the organization chart in Figure M-29.

During the preconstruction phase the engineers reporting to the Environmental Engineering Manager will be gathering and evaluating data along the route of the pipeline and at compressor station sites, establishing parameters, and planning the environmental aspects of construction. Meanwhile, the Contracts Administration personnel will be formalizing inquiries for the construction effort, developing contracts

8.3 PRECONSTRUCTION, TRANSITION, AND CONSTRUCTION PHASES (Continued)

to cover this work, and negotiating these contracts with contractors and suppliers. Formal scope packages will include the designs prepared by engineering operations throughout this phase. The project procurement team will carry out all commercial arrangements related to materials and equipment production and transport, and set up the detailed material management plan. The project controls groups will formalize estimates, budgets, and plans for all the groups in appropriate formats and levels of detail.

The efforts of both Environmental and Contracts Administration personnel will be supportive of the Engineering Operations Manager and his staff, whose work is central to the preconstruction phase operations. The Engineering Operations Manager is responsible for the engineering and detailed design of all aspects of the project, whether carried out directly by the PMC or by a PMC-supervised contractor.

As the preconstruction phase of the project is completed and the construction phase begins, the Project Directorate will relocate to Fairbanks. When this occurs, the Project Operations team in Irvine will be expanded by the addition of a Quality Compliance Manager and an Administration Manager, along with their respective teams. Aside from these additions, the construction phase PMC Project Operations organization chart (Figure M-30) is quite similar to the corresponding preconstruction phase chart.

When the construction activity moves to the field, the Alaskan Operations Manager position will be terminated and its duties assumed by the Director, Alaskan Operations. Four Irvine-based managers, together with their respective staffs, will relocate to Fairbanks. These include the General Administration Manager; Construction Manager, Pipeline; Construction Manager, Facilities; and Construction Services Manager. In Fairbanks, the field programs and civil works positions will be terminated and any remaining responsibilities will be assumed by other line operations. The temporary facilities and communications facilities functions will move to report to the Construction Manager, Facilities. Project Controls and Quality Compliance will report directly to their respective department directors, who will also be relocated from Irvine to Fairbanks.

8.3 PRECONSTRUCTION, TRANSITION, AND CONSTRUCTION PHASES (Continued)

Final engineering and design work will be under way in Irvine and Houston in mid-1980 and will be completed in early 1983. Technical specialists will then continue their support of the materials management and inspection efforts, field engineering, final checkout, and the startup of the Segment facilities.

Procurement and material management activities outside Alaska will be based in the PMC offices in Irvine, California. This will include all procurement steps from inquiry through shipment to Alaska. PMC offices in the Far East, Europe, and Canada will coordinate orders placed outside the Lower 48 under direction from the Project Procurement Manager in Irvine.

Alaskan procurement, logistics, and priority decisions related to construction needs will be controlled from Fairbanks.





FIGURE M-26

ALASKAN OPERATIONS PMC ORGANIZATION – IRVINE

PRECONSTRUCTION PHASE



ALASKAN OPERATIONS PMC ORGANIZATION – FAIRBANKS

PRECONSTRUCTION PHASE



PROJECT OPERATIONS PMC ORGANIZATION - IRVINE

PRECONSTRUCTION PHASE





FIGURE M-30

EXHIBIT N

REVENUES - EXPENSES - INCOME

Alaskan Northwest Natural Gas Transportation Company ("Applicant"), as previously mentioned in Exhibit L, will file its Financing Plan as a supplement to the material filed in the instant application. Materials included in Exhibit L will provide vital input to Exhibit N. Therefore, Exhibit N will be submitted in conjunction with Exhibit L.

Exhibit N will be filed in accordance with Section 157.14 (a) (16), Title 18, C.F.R., as applicable.

EXHIBIT O

DEPRECIATION AND DEPLETION

Alaskan Northwest Natural Gas Transportation Company ("Applicant") in accordance with its FERC Gas Tariff, Original Volume No. 1, as approved by FERC Order Nos. 31 and 31-B June 8, 1979 and September 6, 1979, respectively, at Docket No. RM 78-12, will determine its depreciation and amortization provisions pursuant to Section 4.4 of Rate Schedule T-1 as follows:

"4.4 Depreciation and Amortization Expense

The amount shall be for depreciation and amortization of Company's depreciable or amortizable gas plant properly recorded in Account Nos. 403 through The amount for depreciation shall be equal 407.2. to one-twelfth of the sum of the products resulting from multiplying each annual straight-line depreciation rate set forth in the Depreciation Rate Table below, times the actual original cost, at the beginning of the billing month, of the depreciable or amortizable items in each class of gas plant on such Table to which such rate applies; provided, however, that (a) leasehold improvements may, at the option of Company, be amortized on a straight-line basis over the initial term of the lease to which such leasehold improvements relate, and (b) transportation and power operated equipment may, at the option of the Company, be depreciated using an accelerated method of depreciation and five year life."

DEPRECIATION RATE TABLE

Classes of Gas Plant in Service	Uniform System of Accounts Account Nos.	Annual Straight-Line Rate
Communication, office, shop garage, stores, laboratory, miscellaneous equipment tools, office furniture and other tangible property	370,391,393 394,395,397 398 and 399	10%
Transportation and power operated equipment	392 and 396	20%
All other gas plant in service	301 through 399 except those listed above	4%

The 10% and 20% rates are based on the estimated useful life of the various classification of property and are consistent with the general practice in the industry.

The 4% rate of depreciation is based on the expectation that gas purchase contracts which will be executed by shippers and producers will generally contain primary terms of twenty-five (25) years. The final depreciation rate will be tied to the life of the supply contracts and other relevant factors.

EXHIBIT P

TARIFE

Alaskan Northwest Natural Gas Transportation Company ("Applicant") filed its FERC Gas Tariff, Original Volume No. 1, on March 12, 1979. By orders dated June 8 and September 6, 1979, in Docket No. RM78-12 (Orders 31 and 31-B), the FERC approved the Applicant's tariff including provisions with respect to billing commencement date, interim rate, service interruption, billing procedures, cost allocation and availability of transportation services. In those orders, the FERC required Applicant to submit for FERC approval, twelve months prior to commencement of operations, a modified tariff which conforms to the requirements of Orders 31 and 31-B.

Applicant will submit, pursuant to Section 157.14 (a) (18), Title 18, C.F.R., as applicable, cost-of-service data in conjunction with the supplemental submittal of Exhibit L (Financing).

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