

FERC -
pipeline Design
+ Capacity -
Comments of

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4/15/79

FERC

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

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

COMMENTS OF THE STATE OF ALASKA

The State of Alaska ("Alaska") offers the following limited comments on the Delegate's Report on pipeline size and operating pressure for the Alaska segment of the Alaska Natural Gas Transportation System. Alaska adopts its comments filed April 5, 1979, as amplified and modified below.

Alaska recognizes, and appreciates, the Commission's concern for expeditious resolution of the issues surrounding the Northwest project. To a significant degree, Alaska shares the desire of the Commission for rapid decision making. For example, although Alaska had different views on the incentive rate of return than the Commission adopted, Alaska recognizes that the issues -- for the most part -- were matters of judgment and policy, ones that even if Alaska had had more time to comment, the final decisions were still within the Commission's discretion.

But in some areas quick and summary resolution is not compatible with either fairness or accuracy. Although a rulemaking proceeding can swiftly clear away non-contested areas, or resolve matters that will always be, in the last resort, subjects of the Commission's discretion, it simply cannot paper over serious questions of fact. When, during comments on rulemaking, a serious and substantial question of fact arises, the Commission cannot choose the assertions it wishes to believe. Not only will wishing not make it so, but also Commission policy and judgment will most probably not be realized in fact. One such question of fact arose during the comments on the CO2 standard concerning lower-48 practices. The actual practice in the lower-48 not only affected the allocation of costs between the Project and the producers, but also influences the Commission policy not to burden on lower-48 consumers with unnecessary costs.*/

*/ For example, to the extent that CO2 is 'removed' from LNG storage in the lower-48, the removal at Prudhoe Bay is simply an extra cost that may be borne by lower-48 consumers.

One other factual problem which also is of the same nature has arisen in this proceeding, relating to liquids carriage and the location of the conditioning plant.

Alaska has consistently taken the position that one of its prime concerns, and a concern of significance to the Commission, is preserving the option of maximum liquids transportation. And, related to this is the primary concern of both the Commission and Alaska that the entire system, both the conditioning plant and the pipeline, be constructed in the most efficient and least expensive manner practicable.

Unfortunately, a major component of the entire system's cost has not been adequately considered by the Commission. As a result, this Commission lacks complete information on not only a key feature in the design of the entire system, but also a major component of the financing cost of the entire project, and of the quality of the gas and gas liquids that could be made available not only to Alaska but lower-48 consumers as well.

In addition, lack of detailed information has severely hampered Alaska in deciding whether, to what degree, and on what conditions it will actively support this Project. Alaska even has a problem in deciding what it could trade-off if such trade-offs became necessary, because of confusion in the record and elsewhere as to what is practically available to all parties.

For these reasons, and in light of the Delegate's comments in his report on liquids' questions, Alaska wishes to present here an outline of its understanding of the "facts" of liquids' transportation, and some of the questions it has, and asks the Commission or other parties to correct on the record any misimpressions Alaska may be under.

Alaska understands that a 1260, 48", 18 CO₂ line could, as a practical matter, transport all the ethane, all the propane, and up to 25% (9,000 bbl/day) of the butane that could potentially be made available from Prudhoe Bay Unit.*/ Alaska also understands that raising the CO₂ content of the pipeline will not significantly increase the liquids' carriage of the line, except insofar as more mcf's overall are transported.

With regard to liquids, however, the question is whether the maximum amount of liquids will be made available at the inlet

*/ Alaska understands that the chart attached as Exhibit B to our reply comments, which show a greater amount of butane being able to be transported, is, as a practical matter, impossible to obtain because some pentanes plus will remain with the sales gas, lowering the available capacity for other liquids.

to the pipeline. This is primarily due to: (1) the need for field and local fuel; (2) the need to supply TAPS with fuel; and (3) the process used to strip CO₂ from the raw gas.

The Parsons design plans to condition the gas in a two-stage process. First, the gas will be chilled to -30°, which will drop out most of the butane, most of the pentane, about 60% of the propane, and very little of the ethane. The second stage is the removal of the CO₂. The process chosen by Parsons is the SELEXOL CO₂ removal process, which is a physical absorption system. One effect of this system is that 1/3 of the available ethane will be stripped along with the CO₂ and, to the extent CO₂ is not put in the pipeline, that ethane is lost to downstream use.

After stripping the CO₂, the conditioned gas has a severely reduced liquids' ratio: ethane is reduced from 6.48% to 4.47% (with the remaining ethane mixed up with the CO₂); propane is reduced from 3.48% to .08%, and butane is reduced from 1.66% to .03%.

At this point there are possible reblendings of the stripped propane and butane back into the conditioned gas before it enters the pipeline. This does not apply, however, to the lost ethane, which follow the extracted CO₂.

Under the Parsons primary blending plan, 40 MMSCFD with a BTU content of 858 will go to TAPS, 399.4 MMSCFD with a BTU content of 825 will go for field fuel, and 192 MMSCFD with a BTU content of 475 will be used for local turbine fuel, and 56.7 MMSCFD with a BUT content of 212 will be used for local heater fuel. Except for TAPS fuel, the primary source of the field and local fuel will be the CO₂/ethane stream, spiked as necessary with propane to reach the higher BTU requirements as necessary. Butane apparently is unacceptable for spiking purposes, primarily because of surging.

Because of the need to spike the CO₂/ethane stream to variously higher BTU contents, under half of the available propane will be injected into the sales gas stream. (24,270 bbl/day out of an available 52,350 bbl/day).

Although a rise to a 3% CO₂ level would increase the propane in the pipeline gas by about 15,000 bbl/day, the amount of ethane would stay about the same, and the amount of butane would decrease (because more propane would take up the available space).

The major remaining problem is disposition of the butane. Since butane will not be used for field or local fuel, the only remaining place for butane is: (1) pipeline gas, (2) TAPS; or (3) reinjection. One problem with a 1260, 48" line is that even with the reduced amount of propane made available, at least 15%

of the butane cannot be placed in the gas pipeline. But in order for the butane to be transported through the TAPS line, the oil must be cooled substantially to meet the vapor pressure requirements of both the TAPS line and California. This requires field costs of approximately \$60 million, along with additional costs in TAPS for the increased wax-buildup and other problems.

Therefore, it appears to Alaska that if present plans progress, the option of liquids' transportation sufficient to make a petrochemical industry feasible even if the option were more attractive in the future than now is severely, if not fatally, hampered. The selection of a physical, rather than chemical, absorption process is one problem. A chemical process could make available all the ethane, not just 66%; however, a chemical process, Alaska has been informed, requires 10-15% more fuel, is more expensive, and will have some adverse effects in meeting the field and local fuel problems. Although the field is designed to take alternatives to the proposed fuel stream, even if, say, methane is used, the present CO₂ process would have to be completely changed to recover all the ethane.*/

Second, even if the conditioning plant could provide the line with all it could handle, most of the butane would be lost to the gas stream. Further, a substantial portion of butane is lost under any scenario for blending of the liquids.

Third, the location of a conditioning plant is also an issue; the material to be submitted by Earth Resources (i.e., the Litwin Study), indicates that substantial savings may be possible by locating the conditioning plant at Fairbanks and building a higher pressure line from Prudhoe to Fairbanks. Although Alaska recognizes that there would be added costs as well, and that it may be that when all problems are considered, including such things as field fuel, CO₂ disposal, the accuracy and applicability of the Litwin study, etc., a conditioning plant at Fairbanks is infeasible, Alaska is not satisfied that the matter has even been addressed in any rigorous manner, although it hopes that it will be either here or in the environmental analysis to be conducted.

If there is to be any possibility that Alaska will participate in pipeline financing, the action must not only be economically attractive, but also politically and popularly attractive to the citizens of the state. One of the hopes of a major segment of the Alaska citizenry is the possibility of a major liquids'

*/ This is not to say that the Commission has jurisdiction over the plant but only to suggest a total system approach is lacking.

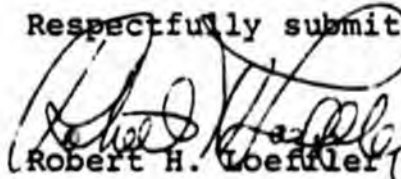
extraction and petrochemical facility in the Interior. In addition, although the present prevailing wisdom is that a petrochemical facility based upon the gas stream is economically infeasible, no one can predict the petrochemical future in the next 10 years, much less over the major portion of this pipeline's life.

Alaska believes that, where possible, the option of future liquids' transportation sufficient to support a petrochemical industry be kept open. Unfortunately, given both this Commission's present speed-up and the piecemeal resolution process, an overall resolution of all the competing problems if the present course continues is highly improbable.

Alaska would suggest that where problems like this arise, the Commission either hold hearings on particular factual matters where a factual conflict appears on the record; conduct an independent investigation to ascertain the correct answer; or devise some means of resolving the conflict rather than arbitrarily picking or choosing. Second, Alaska would also suggest that the Commission consider on the record matters which may not be directly before it in a narrow sense, since everything the Commission does impacts upon many other matters, such as financing and liquids, so that parties may have a complete understanding of where they stand and can make changes based both upon that understanding and upon an assurance that the Commission has considered their particular problems in some detail.

Finally, with regard to a final order on pressure and size, Alaska, without answers as to the relative expense of a conditioning plant at Fairbanks, the trade-offs of the costs of a higher pressure line, higher CO2 content, alternative CO2 removal systems, and other matters, cannot take an unconditional position. Neither, Alaska believes, can the Commission.

Respectfully submitted,



Robert H. Loeffler

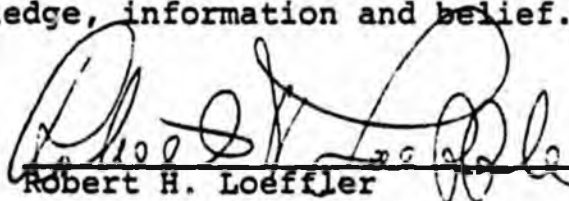
MORRISON & FOERSTER
1025 Connecticut Avenue, N. W.
Washington, D. C. 20036

Attorney
for the
State of Alaska

VERIFICATION

DISTRICT OF COLUMBIA: ss

Robert H. Loeffler, being first duly sworn, deposes and says that he is an attorney for the State of Alaska, that he is authorized to execute, verify and file this document for, on behalf and in the name of said State; and, that he has examined the statements set forth herein and that the same are true and correct to the best of his knowledge, information and belief.


Robert H. Loeffler

SUBSCRIBED AND SWORN TO
before me this 2nd day
of July, 1979.


Notary Public

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon all parties included on the service list in this proceeding in accordance with the requirements of Section 1.17 of the Rules of Practice and Procedure.

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


Robert H. Loeffler

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100-10

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

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

COMMENTS OF THE STATE OF ALASKA ON THE
DESIGN SPECIFICATIONS AND INITIAL SYSTEM
CAPACITY OF THE ALASKAN SEGMENT OF THE
ALASKA HIGHWAY PIPELINE PROJECT

The State of Alaska ("Alaska") offers the following comments on the application of Alaskan Northwest Natural Gas Transportation Company ("the Partnership") for an order establishing the size and pressure of the Alaskan segment of the Alaska Highway Pipeline Project. The application, which was placed on public notice March 16, 1979, seeks an order establishing a maximum working pressure of 1260 psig and a size of 48-inches for the Alaskan segment.

As both the application and notice of application properly state, Alaska has been closely concerned with the possibilities for productive use within Alaska of natural gas liquids from the North Slope. This concern reaches not only the liquids' carrying capacity of the line, but also the location of the conditioning plant as it is affected by size and pressure considerations. And, Alaska has always favored the common sense approach of planning now for the future so that the line as built will be able to carry additional gas reserves should they become available. Alaska has worked closely with the Partnership to resolve these issues without foreclosing any realistic opportunities that would favor the utilization of liquids in Alaska.

As part of this effort, Alaska requested of the Partnership confirmation of the statement in the application that the proposed pipeline can transport all the ethane and propane that could be available in the gas stream from Prudhoe Bay. A copy of Alaska's request is Exhibit "A" hereto. The Partnership promptly responded by letter of its Vice President, Regulatory, Environmental and Civic Affairs. A copy of the response is Exhibit "B" hereto. Alaska requests

that the exchange of correspondence be brought to the Commission's attention when it acts upon the application.^{1/}

Alaska has reviewed the application and associated material and has made the following assumptions as to the scope of the Order requested by the partnership.

Based on the representations of the Partnership stated in Exhibit "B," Alaska is presently satisfied that its concerns with liquids' carriage do not conflict with the entry of the requested order establishing size and pressure. If, in the future, other professional data should become available to Alaska which seriously conflicts with the representations in Exhibit B, Alaska then would have to consider whether to seek an appropriate procedure for the satisfactory resolution of the conflict. Alaska does not seek such a procedure now and does not expect to seek one in the future.

Alaska also shares what it believes is the operating assumption of all concerned: that the conditioning plant will be located at Prudhoe Bay. Alaska believes that all recognize that this matter will not be settled until gas sales contracts are negotiated and the Commission releases an Environmental Impact Statement concerning the alternative locations and configurations of the conditioning plant. If the contracts or the Environmental Impact Statement (or both) should establish that a place other than Prudhoe Bay is the most desirable site for the conditioning plant, or that a different configuration for the plant is more desirable, the Commission would have to ensure that the most desirable alternative were pursued. As part of this effort, the Commission might have to reconsider its pressure decision, at least with respect to the segment between Prudhoe Bay and the preferred site for the conditioning plant.

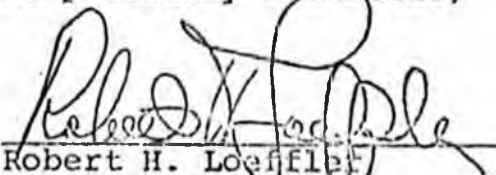
Alaska also understands that the matter of a minimum Btu requirement for pipe'ine quality gas will not be considered or established by the Commission in acting upon this application. This may fall within the omnibus tariff proceeding, the gas sales process, or, conceivably, elsewhere.

^{1/} The Alaska Gas Pipeline Office has conducted an informal inquiry on size and pressure questions. Alaska, among other parties, filed comments and participated in a conference that the Office called upon the subject. The Office also issued a draft report on this subject on September 27, 1978. Alaska recommends that the materials assembled in this inquiry be made a part of the official record of this proceeding.

Finally, Alaska is concerned with the CO₂ standard to be established for transportation of the North Slope gas. Alaska assumes that this matter also is not within the scope of an order establishing size and pressure, but will be resolved in the contracts, in the tariff proceeding, or in an entirely separate proceeding devoted to this question. In its reply comments in RM79-19, Alaska has urged a more liberal CO₂ carriage standard and a specific inquiry devoted to the question of the proper CO₂ standard. Alaska renews this suggestion and urges that it be pursued separately and apart from the conditioning cost proceeding.

Based on the stated assumptions as to the scope of the requested order, Alaska supports the application of the Partnership for an order establishing size and pressure.^{2/}

Respectfully submitted,


Robert H. Loeffler

ISHAM, LINCOLN & BEALE
Suite 701
1050 Seventeenth Street, N.W.
Washington, D.C. 20036

Attorney
for the
State of Alaska

April 5, 1979

^{2/} Alaska respectfully requests that it be advised should any of these assumptions be incorrect so that it may then consider whether another procedure is indicated to protect its interests.

ISHAM, LINCOLN & BEALE
COUNSELORS AT LAW

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March 23, 1979

Darrell B. MacKay
Vice President
Northwest Alaskan Pipeline Company
Suite 901
1801 K Street, N.W.
Washington, D.C. 20036

Dear Darrell:

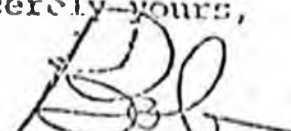
The Application of Alaskan Northwest Natural Gas Transportation Company for an Order Approving the Design Specifications and Initial System Capacity of the Alaskan Segment of the Alaska Highway Pipeline Project states that the 1260, 48" line could carry all the ethane and propane, and most of the butanes, that could be made available from the Prudhoe Bay Gas Stream, whether or not the conditioning plant made those amounts available. Application, 9. As you are aware, the amount of liquids able to be transported past Fairbanks is of vital concern to the State. Assuming this to be the case, then many of the State's concerns about the pressure and size of the line are alleviated, for the focus is then shifted to the amount of gas liquids that the conditioning plant will inject into the sales gas stream.

Unfortunately, beyond conclusory statements and summaries, there is no information in any public record which would allow an independent evaluation of your assessment of the liquids question. Since the matter is of vital concern to the State, we request that you make available to us sufficient detailed information which would allow an independent evaluation by a qualified engineer or other professional of the accuracy of your assessment.

Since the matter is of public concern to the State, we intend to make both the independent evaluation and your information a matter of public record.

Thank you for your consideration in this matter.

Sincerely yours,


Robert H. Loeffler

Attorney

RHL/kc

NORTHWEST ALASKAN PIPELINE COMPANY

1801 K Street, N.W.
Washington, D.C. 20036
(202) 466-5250

March 27, 1979
RECA 79-1065

Robert H. Loeffler, Esq.
Isham, Lincoln & Beale
1050 17th Street, N.W.
Suite 701
Washington, D.C. 20036

Dear Bob:

The purpose of this letter is to respond to your request of March 23, 1979, for additional documentation concerning the statement in the Application of Alaskan Northwest Natural Gas Transportation Company for an Order Approving the Design Specifications and Initial System Capacity of the Alaskan Segment of the Alaska Highway Pipeline Project that

"... the proposed pipeline system can transport all of the ethane and propane that could be available in the gas stream from Prudhoe Bay." (p. 9)

Attached are two exhibits which show the basis for this conclusion. Exhibit I summarizes the volume of liquids which would be transported in the pipeline at a design pressure of 1260 psig without regard to the conditioning plant process. Column (b) shows the gas composition at the point in the field where the oil and gas are separated. This composition was taken from the September, 1978 study report "Sales Gas Conditioning Facilities, Prudhoe Bay, Alaska" by the Ralph M. Parsons Company. Column (c) shows the barrels per day of ethane and heavier hydrocarbon liquids that would be contained in a total volume of raw gas of 2.8 Bcf per day. These calculations are determined from standard densities for each component. The volume of 2.8 Bcf per day is the approximate field production required to deliver 2.0 Bcf per day of conditioned gas in accordance with the Operating Plan approved by the State in June, 1977. Column (d) shows the quantities of liquids that would have to be removed to accommodate the hydrocarbon dew point specifications of -10°F at 1000 psia for the design pressure of 1260 psig. The basis of these calculations is described in connection with Exhibit II. It is important to

EXHIBIT "B"

Robert H. Loeffler, Esq.
March 27, 1979
Page two

note that these volumes are determined without regard to equilibrium calculations related to a specific process. In actual practice some amount of ethane and propane would be removed and some amount of pentanes and heavier components would remain in the gas. This variation does not detract from the conclusion that the pipeline system at 1260 psig could transport all ethane and propane that is available in the raw gas. Column (e) is the difference between Columns (c) and (d) and shows the quantity of liquids that are available for fuel at Prudhoe Bay, for extraction at any point along the pipeline system in Alaska or for retention in the gas stream.

Exhibit II shows the phase envelope for a gas composition based on reducing the carbon dioxide content and removing the liquids shown in Column (d) of Exhibit I but retaining all of the ethane and propane in the pipeline gas stream. As described previously, this composition will be affected by the process utilized to condition the gas. For example, some amount of ethane and propane will be removed from the raw gas and consumed as local fuel irrespective of the gas conditioning process method actually employed. Any such reduction in ethane and/or propane content of the sales gas allows some additional butanes to be carried in the gas pipeline without exceeding the hydrocarbon dew point specification. However, this illustration shows the theoretical maximum amount of ethane and propane that could be made available to the pipeline. It can be seen that this mixture meets the required hydrocarbon dew point specification of -10°F , 1000 psia required to prevent retrograde condensation in the transmission system. A similar phase envelope for a similar mixture was previously submitted by EXXON to FERC April 3, 1978 (Figure 2, Curve 2 of the EXXON response).

We believe that the enclosed information is sufficient for an independent evaluation of these figures by a qualified engineer. I would like to reiterate as stated in our Application that since the recommended raw materials for a petrochemical plant are ethane and propane we are not inhibiting the State's flexibility to develop a petrochemical industry, at any time,

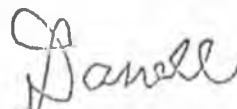
EXHIBIT "B"

Robert H. Loeffler, Esq.
March 27, 1979
Page three

if it is feasible. We continue to believe that the State will realize the most value from liquid hydrocarbons that are not utilized within the State by leaving these hydrocarbons in the gas stream for resale as part of the Alaska Highway Pipeline Project. We have no objection to your making this material a matter of public record and believe that it fully supports our position.

Very truly yours,

NORTHWEST ALASKAN PIPELINE COMPANY



Darrell B. MacKay
Vice President, Regulatory,
Environmental and Civic Affairs

DBM/dm

Enclosures

NORTHWEST ALASKAN PIPELINE COMPANY

NATURAL GAS LIQUID AVAILABILITY

Line No.	Components	Separator Off-Gas Composition Volume %	BARRELS PER DAY		
			Liquids Available From 2.3 BCF/D Of Off-Gas	Liquids Removed For 1260 PSIG Pipeline Design	Liquids Available For Fuel, Extraction Or Retention in the Gas
	(a)	(b)	(c)	(d)	(e)
(1)	CO ₂	12.63	-	-	-
(2)	Nitrogen	0.47	-	-	-
(3)	Methane	74.15	-	-	-
(4)	Ethane	6.48	115,470	0	115,470
(5)	Propane	3.48	63,830	0	63,830
(6)	i-Butane	0.49	10,680	5,340	5,340
(7)	n-Butane	1.17	24,580	12,290	12,290
(8)	i-Pentane	0.27	6,590	6,590	0
(9)	n-Pentane	0.49	11,830	11,830	0
(10)	Hexanes+	0.37	10,141	10,141	0
(11)	TOTAL	<u>100.00</u>	<u>243,121</u>	<u>46,191</u>	<u>196,930</u>

EXHIBIT "B"

PHASE ENVELOPE FOR MIXTURE CONTAINING
ALL OF THE ETHANE AND PROPANE AND
50% OF THE BUTANES AVAILABLE FROM
PRUDHOE BAY SEPARATOR OFF-GAS

MOLE %

METHANE	85.81
ETHANE	7.50
PROPANE	4.03
I-BUTANE	.29
N-BUTANE	.67
CO ₂	1.16
NITROGEN	.54
<hr/>	
TOTAL	100.00

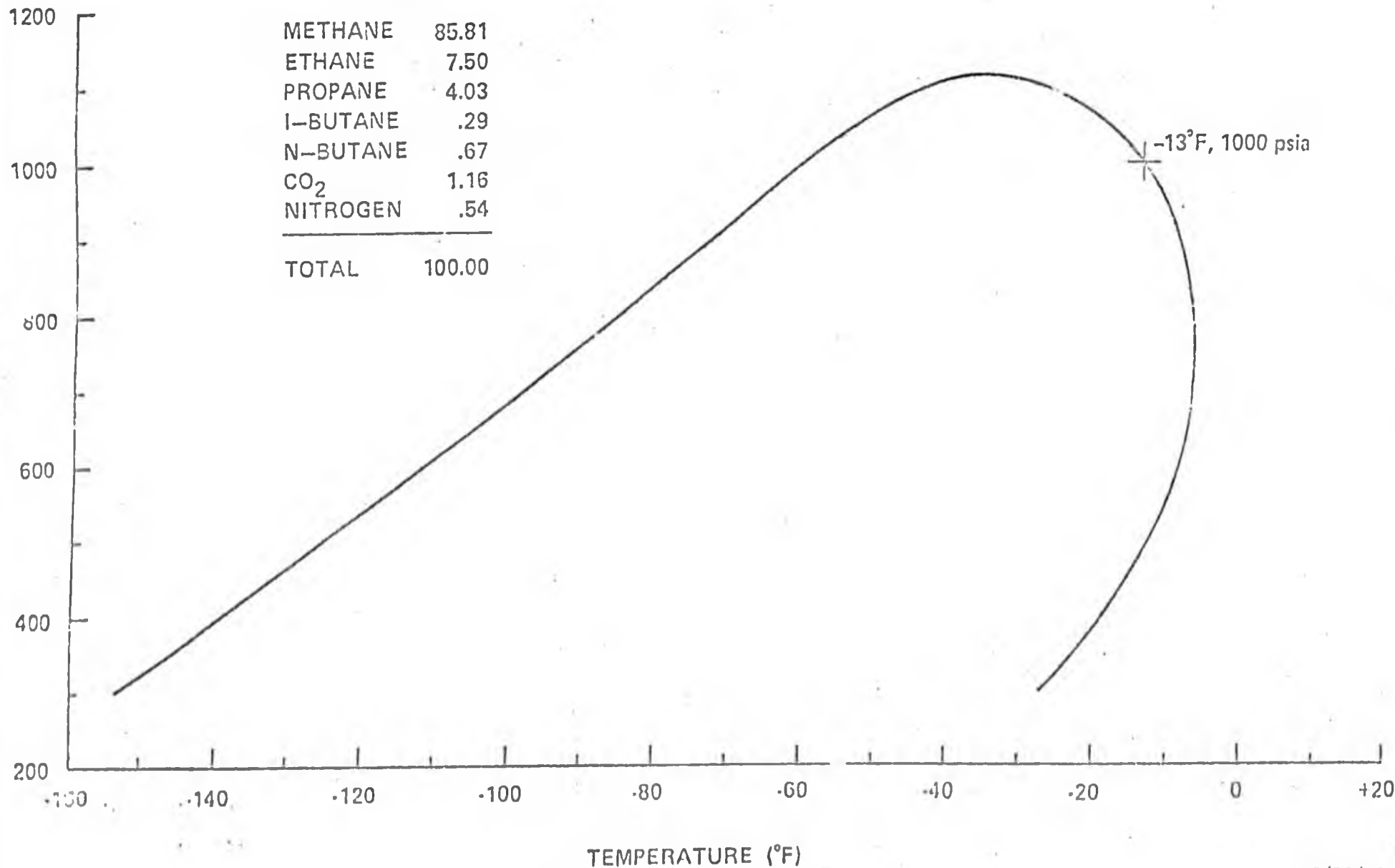
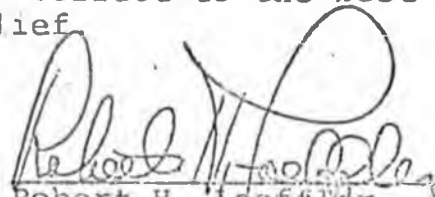


EXHIBIT "B"

VERIFICATION

DISTRICT OF COLUMBIA: ss

Robert H. Loeffler, being first duly sworn, deposes and says that he is an attorney for the State of Alaska, that he is authorized to execute, verify and file this document for, on behalf and in the name of said State; and, that he has examined the statements set forth herein and that the same are true and correct to the best of his knowledge, information and belief.


Robert H. Loeffler

SUBSCRIBED AND SWORN TO
before me this 5th day
of April, 1979.

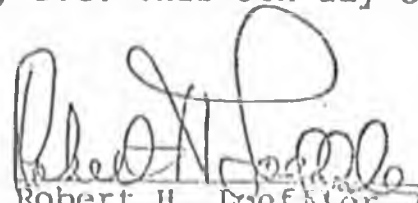

Notary Public

My Commission Expires September 14, 1982

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon all parties included on the service list in this proceeding in accordance with the requirements of Section 1.17 of the Rules of Practice and Procedure.

Dated at Washington, D.C. this 5th day of
April, 1979.


Robert H. Loeffler