

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 86/29

649 SCOMM21: ROYALTY OIL & GAS FILES 1977-78

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INTERIM REPORT
OF THE
JOINT GAS PIPELINE IMPACT COMMITTEE

This Committee, through public hearings and staff investigation, has become convinced that immediate action by the State of Alaska is essential if the citizens of this State are to receive maximum benefit from the State's natural gas resource.

The Committee will issue a full and complete report on its findings and recommendations at a later date, but is impelled to submit this interim report to the Legislature and the people of the State of Alaska because of the urgency of the present situation.

The Committee finds and concludes the following:

1. A federal decision authorizing the transportation of North Slope natural gas across Canada would be inimical to the interests of the State of Alaska. The State's resource would be drained, its people denied access to a premium fuel and raw material, its work force deprived of employment opportunities, and productive economic growth would be thwarted.
2. A federal decision authorizing the transportation of North Slope natural gas across the State of Alaska to an open port will serve the best interests of the State.
3. The level of benefits, and burdens reasonably to be expected by the State as a consequence of any decision on a North Slope gas transportation system are of such magnitude that the routing decision must be regarded as critical to the future of the State. Action to secure a Trans-Alaska routing must be pursued as expeditiously as possible; no reasonable step should be left untaken.
4. The position of the state as owner of a one-eighth royalty in natural

gas and natural gas liquids produced from State-owned lands on the North Slope creates an immediate opportunity for effective State action which can assist in securing a Trans-Alaska transportation system.

5. Affirmative, aggressive action by the Governor, the Commissioner of Natural Resources, the State Royalty Board, and the Legislature with respect to the State's royalty gas is imperative.
6. Effective use of the State's royalty gas, to serve the best interests of the State, requires:
 - a. The State must elect to take its royalty share of natural gas and natural gas liquids in kind.
 - b. The State must commit a portion of its royalty gas to purchasers who will assist in securing approval of a Trans-Alaska transportation system, and who will thereafter utilize such a Trans-Alaska system.
7. Present levels of natural gas demand in Alaska permit a commitment of a portion of the State's royalty gas to purchasers outside the State; while every effort must be made to retain a substantial part of Alaska's gas for present and future in-state needs, it is in the overall best interests of the State to offer for sale outside the State, a substantial portion of the State's royalty gas to purchasers who can, and will, assist in securing authorization of a Trans-Alaska transportation system.
8. Those persons and firms interested in the construction and operation of a Trans-Alaska transportation system can materially alleviate State unemployment problems, and the State should, in striking a bargain for the commitment of State resources to a Trans-Alaska

system, secure appropriate commitments for the hire and training of Alaska residents in the construction and operation of such a system.

9. Finally, the risk that non-action by the State, or delayed action by the State, will cause the selection of a Trans-Canadian routing, and the risk that the State will lose substantial benefit of its natural gas resource are so great, it is the sense of this Committee that State action must not be delayed.

BY REASON OF THE FOREGOING, IT IS THE RECOMMENDATION OF THIS COMMITTEE THAT:

1. The commissioner of Natural Resources and the State Royalty Board should undertake immediate negotiations with interested out-of-state purchasers to reach definitive sales and/or exchange agreements covering disposition of substantial portions of the State's royalty gas on the best obtainable terms.
2. The Commissioner of Natural Resources and the State Royalty Board should undertake immediate negotiations with natural gas transporters involved in the proposal for a Trans-Alaska system to reach definitive transportation agreements covering the State's royalty gas sold for out-of-state use, and the State's withdrawal of the unsold portion of its royalty gas from the system for in-state use; appropriate commitments should be obtained with respect to hire and training of Alaska residents.
3. The arrangements and agreements so negotiated should be presented to the Legislature for ratification prior to the end of the Second Session of the Ninth Legislature to avoid, if possible, a special session.
4. The Legislature should hold itself ready for immediate consideration

of and prompt action on, the recommendations of the Commissioner and Board.

5. Such arrangements, contracts, and agreements as are negotiated by the Commissioner and Board and approved by the Legislature should be incorporated into the pending applications for a Trans-Alaska transportation system, presented to the Federal Power Commission by the appropriate transporter-applicant, and approval thereof obtained in the pending Federal Power Commission proceedings.
6. The Legislature should adopt SCR 66 and further seek the active cooperation of all owners of North Slope gas in support of the Trans-Alaska pipeline route.



JUNEAU, ALASKA

Alaska State Legislature

Senate

A G E N D A

GAS PIPELINE IMPACT COMMITTEE

PUBLIC HEARINGS

FEBRUARY 17, 18, & 19 - Supreme Courtroom A, 1-5 PM

FEBRUARY 17

- 1:00 PM NBC Whitepaper "Natural Gas"
- 1:45 PM Rush Moody Jr.
- 3:00 PM George Sellides - Uses of Natural Gas in Alaska
- 3:30 PM Anchorage Natural Gas, Dale Teel
- 4:00 PM OMAR
- 4:30 PM BP Alaska, Joe Josephson

FEBRUARY 18

- 1:00 PM Legislative Committee on Taxation and Revenue
- 1:30 PM Wentworth Brothers, J.J. Schons
- 2:30 PM Fairbanks Industrial Corporation,
Associated General Contractors, Conrad Frank
- 3:00 PM National Electrical Contractors Association, Julius Kornfiend
- 3:30 PM Federal Labor Council of Fairbanks, Dave Rasley
- 4:00 PM Anchorage Municipal Light and Power, Tom Stahr
- 4:30 PM State of Alaska, Patrick Dobey

AGENDA
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FEBRUARY 19

1:00 PM State of Alaska, Guy Martin, William Fackler, Easy Gilbreth

2:00 PM El Paso

3:00 PM Tenneco

3:30 PM ARCO

4:00 PM Exxon

4:30 PM Collier Chemical Corporation

NATURAL GAS FACT SHEET

SADELROCHIT RESERVOIR

Estimated reserves= 26 to 32 Trillion Cubic Feet (TCF)
Estimated daily flow from pipeline= 2.5 Billion Cubic Feet* (BCF)
Estimated yearly flow = .9 Trillion Cubic Feet

Alaska's royalty share= 3.25--4 TCF
Daily royalty share = 312 Million Cubic Feet (MMCF)
Yearly royalty share = 114 BCF

*Department of Interior study.
More proven reserves are expected to be proven in the North Slope area.

ALASKAN USE

Almost all the natural gas used in Alaska is in the Cook Inlet area.

Anchorage Natural Gas uses about 30 BCF per year.
That is equal to 12 days production from Prudhoe Bay.
On a cold day in Anchorage, about 120 MMCF is used.
Anchorage Natural Gas has firm commitments for 10--15 years of gas from Cook Inlet.

Phillips Petroleum uses about 61 BCF per year, most of which is liquified and shipped to Japan.

Collier Chemical Corporation uses about 21 BCF per year in their Ammonia/Urea plant. They are now doubling their operation.

One thousand cubic feet of gas (1 MCF) is equal to about 1 Million BTU. North Slope gas is particularly "rich" at about 1.1 MMBTU.

Six MCF of gas is roughly equal to one barrel of oil.

Consumers are willing to pay a premium for gas. It is a clean energy source.
On strictly energy equivalent, \$2.00 per MCF gas = \$12 barrel oil.
Considering the advantages of using gas, \$2.00 gas = \$9 barrel oil.

United States gas production has declined from a peak of about 62 BCF per day in 1973 to 55 BCF/day in 1975.

BAKER & BOTTS

1701 PENNSYLVANIA AVE., N. W.
WASHINGTON, D. C. 20006

ONE SHELL PLAZA
HOUSTON, TEXAS 77002
TELEPHONE (713) 228-1234
CABLE ROTERLOVE • TELEX 76-2779

TELEPHONE (202) 337-4000

ASSOCIATES OFFICES

PASEO DE LA REFORMA 19
MEXICO D. F. MEXICO

81 AVENUE GEORGE 1^{er} ETAGE
PARIS 8, FRANCE

January 14, 1976

Senator John Rader, Chairman
Joint Gas Pipeline Impact Committee
The Legislature of the State of Alaska
Juneau, Alaska 99801

Dear Senator Rader:

Your Committee has asked me to address certain issues relative to the transportation of Alaska natural gas, assuming for the purpose of my analysis that there will be gas available for sale from the North Slope. 1/

I propose to set forth in this letter the conclusions that I have reached as a result of my research and my knowledge of the Federal Power Commission, together with certain alternatives which the State might wish to consider. To this letter I will append the legal analysis which leads to the conclusions expressed herein.

1/ You are aware of the possibility that natural gas production for sale may have a detrimental effect on the recovery of oil. Studies conducted by the Department of the Interior and by H.K. Van Poolen and Associates raise questions in this regard which are now being examined by the Committee. This issue is, I agree, of critical importance to State consideration of natural gas transportation issues, inasmuch as the State may find it necessary, for reasons of conservation, to limit natural gas production or require reinjection of associated natural gas for maintenance of reservoir pressure. Such conservation actions are, in my opinion, legally permissible if necessary to prevent waste, see pp. 85-94 of attached analysis, but might result in an indefinite postponement of a natural gas transportation system.

From the outset, I need to make clear my recognition, that State policy relative to natural gas will develop, as it should, through processes of government, and that these policy decisions will involve consideration of far more than questions of law and Federal policy. What I offer can be only a part of the whole which the State will consider as the State moves forward to a sound and productive policy of resource management. 2/

As a substantive starting point in my report to you, it is my judgment that the State should, from the standpoint of legal consequences, decide as quickly as possible the ultimate goals of State natural gas policy. If the State has a strong concern for a retention of a portion of Alaska gas for future Alaska needs, affirmative and aggressive State action will be necessary. Non-action by the State with respect to disposition and transportation of North Slope natural gas threatens permanent loss of the gas resources insofar as Alaska consumers are concerned; non-action creates a risk that natural gas produced in Alaska will not be available to fulfill future Alaska residential or industrial needs.

Let us assume that the El Paso, Trans-Alaska transportation route is authorized. Non-action by the State will result, sooner or later, in producer sales of eight-eighths of the natural gas stream in interstate commerce, either to an interstate pipeline, to distributors in the lower 48 states, or to direct users in the lower 48 states; and non-action by the state will result in the construction and operation of an interstate transportation system designed for, and financed on, the expectation of the flow of eight-eighths of the deliverable natural gas from the North Slope. If the State permits, by non-action, these developments, then certain legal consequences may be expected.

2/ I would ask it to be understood that my opinions do not reflect considerations outside my area of knowledge and training; I have no basis, for example, for advice on environmental or economic factors; nor can I gauge the will of the citizens of Alaska concerning economic growth and industrial development; nor can I estimate how strong will be the demand for revenue because of programs which the State may determine are necessary.

The issues which I address are, therefore, approached only from the relatively narrow standpoint of law and Federal regulation. I do not presume to prescribe what is "right" or "good" for the State. These determinations are peculiarly within the province of this Legislature, which will, I am sure, look to a much broader range of considerations, information, and analysis than are within my capabilities.

1. If producers market Alaska natural gas in interstate commerce, paying the State a one-eighth royalty in cash, the Federal Power Commission can assert jurisdiction over eight-eighths of Alaska production, and thereby attempt to prevent any later efforts by the producers, or by the State, to withdraw the State's one-eighth royalty share for an in-kind taking by the State for use in the State. (pp. 64-73.)³

2. In the event of such a sale by producers to an interstate pipeline, and in the event of FPC denial of a request to withdraw State royalty gas, the only means for securing gas service in Alaska would be through a future demand by Alaska municipalities or distributors for service by the pipeline; such a request may be treated by the FPC, and lower 48 pipeline or distributor customers, as a request for new service which cannot lawfully be authorized. If the pipeline, at the time of the demand, is unable to render adequate service to its non-Alaska customers, or if grant of the Alaska demand would require to enlargement of pipeline transportation facilities, the Commission may be required, by law, to refuse demands for Alaska service -- even for residential and public service needs.

3. If Alaska can successfully claim -- contrary to the hypothesis in Paragraph 2 -- status as an existing customer, pipeline natural gas supplies would be shared by Alaska and non-Alaska customers on the basis of FPC curtailment priorities and allocation orders.

4. In the event of direct sale by producers to end users in the lower 48 states, or sale to distribution companies in the lower 48 states, there is no clear legal mechanism available to the State of Alaska to secure any portion of the natural gas produced in Alaska for future Alaska needs as they may develop.

Non-action by the State, in my judgment, creates serious risk that Alaska natural gas will not be available for future Alaska needs, even if the El Paso transportation proposal prevails. It is not just the

3/ Page references here and later in this letter are to the attached legal analysis.

potential industrial gas demand (which may or may not be a matter of State concern, dependent on the will of the citizenry with respect to industrial development) that is at risk. The needs of Fairbanks, and other communities, for residential service and service to schools, hospitals, and the like is also threatened.

The risk can be lessened by appropriate state action, as hereinafter discussed, if a trans-Alaska routing is authorized. If a trans-Canada routing is selected, whereby North Slope natural gas leaves Alaska north of the Arctic Circle, the State has no means of protecting its future gas needs. The routing question is, therefore, critical to the State -- at least in the context of future availability of Alaska gas for future Alaska needs. 4/

I am of the firm opinion that neither of the present proposals for transportation of North Slope natural gas offers a substantial guarantee that Alaska natural gas needs will be met. If either the El Paso or the Arctic Gas proposal is approved as presently submitted, the State could well find itself unable to draw upon its own gas resources to meet the future needs of the State.

The problems here are inherent in the nature of the applications and the Natural Gas Act: if the Arctic gas proposal prevails, there is no physical means to move gas from North Slope areas to the State's population centers; the Arctic gas routing will simply preclude gas movement within the State since the gas will leave the State north of the Arctic Circle. If, on the other hand, the El Paso proposal prevails on the basis of present filings with the FPC, the full natural gas stream will begin movement in interstate commerce, and even though it may be physically possible to withdraw gas where and when needed in Alaska, it may be legally impermissible to do so.

4/ Whatever the transportation route, natural gas production and transportation may reasonably be expected to contribute significant revenues and economic activity to the State. Accordingly, even if the transportation system which is Federally authorized does not lend itself to serving state natural gas needs, benefits to the State still might result from natural gas production, and transportation. A decision in this regard involves a balancing of economic, environmental, and political considerations which are beyond the scope of the requested analysis, and outside the scope of my knowledge and experience.

The State's present danger stems from the fact that certificates may issue, and interstate service may commence, without formal recognition of the State's needs. Interstate service unconditioned to Alaska's rights, creates grave problems concerning later attempts by the State to withdraw gas from the system -- problems which arise under Granite City Steel Co., v. FPC, 320 F2d 711 (C. A. D. C., 1963) which suggests that gas customers in Alaska may not be added as pipeline customers if the pipeline is, at the time service to new customers is sought, then unable to meet the needs of existing customers; under Sec. 7(b) of the Natural Gas Act as interpreted by the Commission, which suggests that a partial diversion of the interstate natural gas stream will not be permitted without prior Commission authorization; and under Louisiana Public Service Commission v. FPC, 359 F2 524 (C. A. 5, 1966) cert. den'd. 385 U.S. 833, which holds that commingling of non-jurisdictional natural gas with jurisdictional natural gas results in a single gas stream which is wholly jurisdictional.

It does not follow, however, that Alaska is powerless to influence the movement of North Slope gas in a manner more nearly suited to the State's future gas needs than the proposals now pending. To the contrary, I believe there are reasonable courses of action which the State can pursue.

The State may exercise the option set forth in its oil and gas leases to take royalty gas in kind, and market this production separately from working interest gas; the State need not seek FPC authorization for royalty sales, and should limit the term thereof to the extent possible.

I believe that it would be most unwise, under present circumstances, to permit the producing companies which hold leases on State lands to market the State's royalty share of gas production. If marketing occurs, with the gas moving in interstate commerce, the problems summarized above -- and particularly the Sec. 7(b) abandonment problem -- stand as very real threats to later withdrawal of State royalty gas from the marketing arrangements made by the producers. Most simply put, if 8/8ths of the gas stream is committed to interstate commerce by delivery under an unconditional producer certificate of public convenience and necessity, withdrawal of the royalty 1/8th at a later date may require

FPC approval -- which may, or may not, be forthcoming. This is the lesson of FPC Docket N. C171-879, Superior Oil Company, Letter Order issued June 13, 1975. (PP64-73).

This particular problem can be mitigated if the State exercises its option, prior to the delivery of any gas, to take its royalty share in kind, with appropriate notice to producer, purchaser, and FPC that the producer is without authority to market the State's natural gas.

The State should, therefore, negotiate for separate sale of its royalty gas on the best terms available, giving due consideration to a relatively short-term sale. The State should take the position that it is not subject to the Natural Gas Act, nor to the jurisdiction of the FPC, and that the State is therefore free to make sales for resale in interstate commerce (or in any other market), without certificate authority, and without restriction as to rates or terms of service. This position, though clouded by the Court decision in FPC v. Corp. Comm. of Oklahoma, 362 F. Supp. 522 (W.D. Okla., 1973) aff'd 415 U.S. 961 (1974) is, I believe, legally sound and legally sustainable.

State marketing of its royalty gas is not a complete answer to the basic problem. That gas must be transported, and the only available means of transport will be through the facilities of an interstate pipeline. The FPC can, therefore, exercise indirect control of royalty gas through its certification powers under Section 7 of the Natural Gas Act, even to the extent of denying the right of transportation if it is opposed to the end-use to which the gas will be put, or the price paid for the gas. See FPC v. Transcontinental Gas Pipeline Corp., 365 U.S. 1 (1961), and pp.3-9 of the attached analysis. Thus, it will still be necessary for the State to involve itself in transportation negotiations and see that FPC approval of transportation arrangements is obtained, even if the State markets its own gas by sale at the wellhead or sale downstream. The protection which the State must have is advance FPC approval of State withdrawal of its gas from interstate commerce, but this approval should be sought and obtained by the transporter in connection with its certificate applications and related tariff findings.

In suggesting these actions, I hold to the view that the State's power to call upon the gas resource when needed in the future can, in reasonable probability, be exercised if the State's rights and obligations are fully spelled out, fully presented to the FPC, and accepted by the FPC as an integral part of the transportation system which is certified by the FPC.

While all problems relating to future in-State use of State-owned gas may not be wholly solved by advance agreement, and advance FPC clearance, of specific production, transportation, and sales arrangements, it is my judgment that the problems are reduced to the levels of acceptable risk-taking if the FPC, prior to construction and operation of a transportation system, expressly conditions all necessary certificates of public convenience and necessity and pipeline tariffs to permit and approve such arrangements as are negotiated by the State with respect to its royalty gas.

The State may consider the enactment of legislation to hold State owned resources within the State unless such are surplus to the needs of the state.

Discussed in some detail in the appended legal analysis is a recent Texas statute which is designed to secure for the benefit of the State the resources which are publicly owned. The statute is prospective in operation, and simply requires that all State-issued oil and gas leases shall contain appropriate provisions to prohibit sale of natural gas produced from State-owned lands outside the State unless it is found that such gas is surplus to the needs of the State. (pp 79-85).

While the State clearly may not "embargo" natural gas through exercise of its regulatory powers, (pp 43-45) it may be argued that the State's powers incident to ownership of public lands are different from, and greater than, mere regulatory powers. Cannot the State decide to withhold its lands from development? if so, (and about this I can see little argument), does not this right include the lesser right to permit development only upon terms acceptable to the State as a property owner? (pp. 15-17).

I do not offer an unqualified opinion that such legislation would withstand court challenge; I acknowledge that a challenge would probably be forthcoming, and that the legislation might fall as an undue burden on interstate commerce. Nonetheless, there is some chance of upholding protective legislation, and enactment could serve as a clear Legislative expression of Alaska's determination to retain a fair share of Alaska's resources. (pp 79-85).

The State may consider various means of encouraging conversion of natural gas to methanol, or encouraging extraction of all natural gas liquids, prior to movement of natural gas in interstate commerce.

If North Slope gas is converted to methanol before becoming committed to interstate commerce, the conversion facilities, the methanol itself, and the transportation of methanol would not be subject to FPC control. Since the natural gas would be produced and "consumed" (i.e., converted to something other than natural gas) within the State, the natural gas would never become subject to FPC jurisdiction.

Similarly, if ethane, propane, butane, and other liquids are removed from the natural gas stream prior to transportation or sale in interstate commerce, the extraction facilities, the liquids themselves, and the transportation of the liquids should not be subject to FPC control.

It is beyond the scope of my knowledge to explore the economic feasibility of these alternatives; nor can I judge whether the oil pipeline now under construction can, from an engineering standpoint, serve as a conduit for methanol or other liquids. I believe, however, that the State should be aware that a natural gas stream has enormous potential value other than its obvious value as a heat source. It would be imprudent not to explore all potential uses of the gas stream; particularly where conversion within the State, or liquids extraction within the State, diminishes the range of FPC controls, and where, as here, the use of liquids for generation of heat represents a waste of valuable raw material.

Encouragement of conversion or extraction may be given through legitimate State tax incentives or through dedication, on favorable terms, of State-owned gas to a conversion or extraction project. The most effective means of encouragement should be determined at the time full exploration is made of economic and engineering feasibility.

Legislative action may be considered with respect to extraction operations, but probably may not be considered with respect to a conversion project. The latter situation would almost surely require an impermissible degree of interference with interstate commerce, since any statute directing the flow of natural gas to a con-

version plant would, in actual operation, preclude movement of gas in interstate commerce. Such a restriction would not, in my judgment, withstand Court challenge.

Legislative direction that liquids extraction occur prior to movement of the residue gas in interstate commerce may, on the other hand, be a valid exercise of State regulatory powers to prevent waste. This issue is discussed in some detail in the attached legal analysis (24-100), and I conclude that mandatory extraction, if based on appropriate finding that extraction is necessary to prevent waste of a natural resource, and if properly applied to preclude the possibility of an unconstitutional confiscation, has a reasonable basis and can, therefore, be defended.

In addition to the foregoing alternatives relating to possible State action to retain a portion of the State's gas resources for State use, other, and different, alternatives exist.

What Actions Can the State Pursue to Achieve Benefit from the State's Gas Resources?

Until this point, we have focused on natural gas transportation issues; I suggest that there are other matters which deserve consideration as the State of Alaska moves toward resolution of its basic energy policies. These other matters are not strictly within the request made of me for legal analysis, and indeed some require far more exhaustive consideration before a firm recommendation can be made; I touch upon each briefly because they are germane to the general issues under discussion, and because some, or all, may emerge as part of an overall State strategy of resource management.

1. State leasing policies should be re-examined.

(a) The State is presently leasing on the basis of a one-eighth royalty. Other producing states, notably Texas and Louisiana, now demand, and receive, a one-fifth or one sixth royalty. Alaska should re-assess its bargaining position, its revenue needs, and whether the greater degree of control which in-kind royalty permits, justify leasing in terms other than those presently employed.

(b) Consideration should be given to the possibility that the leasing of State lands, or the withholding of state lands from leasing, is a valid instrument of State policy which can be used to assist in holding State resources for State needs; for example, can

leasing schedules be tied to changes in intra-state supply and demand? Can development be held until the State needs the resource? Here again revenue considerations and State desires regarding the optimum level of drilling and production activity must be weighed, but I suggest that one of Alaska's greatest strengths lies in its ownership of oil and gas bearing lands; thought should be given to the best use of that strength.

2. State taxing policies should be re-examined.

(a) The State presently provides for a production tax on natural gas of 4% of the gross value at the well; other producing states impose a much higher tax--for example, Texas exacts a severance tax of 7-1/2% of the market value of the gas when produced, and Louisiana imposes a basic severance tax of 7 cents/Mcf on natural gas. In considering whether revision of Alaska production taxes is appropriate, thought should be given to the Louisiana form: Louisiana's revenue levels are not controlled by the FPC, while Texas' are, at least to the extent that Texas gas is sold interstate. A further defect in the Texas structure lies in its requirement, in the final analysis, that Texas consumers bear a higher tax than out-of-state users; since the State tax is tied to value, intrastate sales at higher rates than interstate sales produce a higher tax bill for the intrastate producer than for the interstate producer.

(b) Alaska can consider the enactment of a franchise tax on interstate pipelines. Colonial Pipeline Company v. Traigle, 421 U.S. 100, decided April 28, 1975, upheld a Louisiana statute that imposed a franchise tax on a pipeline company that was admittedly engaged exclusively in interstate commerce.

In 1969, a Louisiana Court held that the commerce clause of the Federal Constitution was violated by a state tax "payable for the

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privelege of carrying on or doing business... in this state." The Louisiana legislature then amended the offending provision by providing that the tax was levied upon "(t)he qualification to carry on or do business in this state in a corporate form". The Supreme Court of Louisiana upheld the tax as constitutional levy for priveleges enjoyed by corporations in the state carrying on business, interstate or local, in the corporate form. 289 So. 2d 93 (1974). The U.S. Supreme Court affirmed. The Court cited Memphis Natural Gas Company v. Stone, 335 U.S. 80 (1948), a case that sustained a similar franchise tax imposed by Mississippi on a foreign pipeline corporation exclusively engaged in interstate business. The Court quoted Justice Reed's opinion in the 1948 case: "This is a tax on activities for which the state, not the United States, gives protection and the state is entitled to compensation when its tax cannot be said to be an unreasonable burden or a toll on the interstate business". The "activities for which the state gives protection" included "protection of... maintaining, keeping in repair, and otherwise manning the facilities of the system," the Court said.

Conclusion

As must be evident, it is my view that from the standpoint of legal consequence, the State should pursue an affirmative, aggressive course of enlightened self-interest if the present and future natural gas needs of the State are to be met. The State must decide what it wants, and then set out to achieve its goals.

My judgment is that the State may reasonably expect success in its negotiations. Consider the pressure points available to the State as bargaining levers:

1. Equity favors the State; it seeks nothing more than a share of the resources which it owns. Further, the State of Alaska alone bears a substantial environmental cost as North Slope resources are developed and transported; since this burden exists, an off-setting benefit should be made available to the people of Alaska.
2. The State has as-yet unused regulatory powers which can materially affect the flow of oil and gas.
3. The State has as-yet unused powers of ownership which can materially affect the flow of oil and gas.
4. The State has as-yet unused powers of taxation which can affect the price of oil and gas.
5. The State probably can retain some control of its royalty gas if the State takes effective action; by non-action the State stands to lose control of its royalty gas. The State's position on its royalty gas is of critical significance because it is doubtful that any North Slope transportation system can go forward without commitment of royalty gas to the system, either as part of system supply or as the subject of a continuing transportation agreement. The transportation system needs the royalty gas volumes to support claims of economic viability.

These factors lead me to believe that the State can bargain effectively.

I believe negotiations with both transportation groups are in order. The Arctic Gas proposal has encountered significant opposition, and the FPC staff has only recently concluded that the Arctic Gas group should consider an alternative routing to bring its line down the Alyeska corridor to Fairbanks, and then south eastward. This routing offers an opportunity for physical movement of North Slope gas to, or near, population centers through an Arctic Gas line, a possibility which did not exist so long as Arctic Gas proposed to move eastward out of the State while still within the Arctic Circle.

El Paso should obviously also be approached in definitive negotiations. It has historically supported the principal that a portion of the Alaska gas should be made available for Alaska usage and the El Paso proposal can serve State needs with fewer major revisions than Arctic Gas.

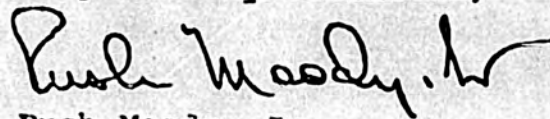
It is, therefore, appropriate for the State to open negotiations with both transportation proponents. It is time to ask, and obtain, positive answers to one basic question: How can Alaska retain the benefit of its natural gas resource under your proposal?

What must be made clear is that the Alaska Legislature and the State Administration, have affirmative duties to ensure, to the fullest possible extent, that the needs of Alaska are served. Others may, and should, consider private interests. But it must be unmistakably clear that Alaska will judge its present and future position on leasing, regulation, taxation, and royalty gas disposition with due regard to Alaska's present and future needs.

It seems to me that if Alaska can derive no benefit from natural gas produced within its borders in the sense of sharing in the use of the resource, then clearly Alaska can protect its citizen's rights only by looking to natural gas as a source of revenue. Every legitimate means of using gas to raise revenue should be explored. If, on the other hand, Alaska is permitted to share in the benefit of a secure and reliable source of natural gas for use as a non-polluting heat source and as a raw material feedstock, then Alaska need place less emphasis on direct revenue and more emphasis on cooperative development.

If men of good will make an intelligent effort at accommodation and understanding, there is no reason why the mutual problems of producer, transporter, and consumer cannot be solved in a manner which balances fairly their respective interests, and which also serves the interests of national and state government as well.

Respectfully submitted,



Rush Moody, Jr.

RM/ap



CITY OF VALDEZ

P. O. BOX 806
PHONE: (907) 835-4313

February 10, 1976

ZIP CODE: 99686

Senator John Rader, Chairman
Gas Pipeline Impact Committee
Pouch V
Juneau, Alaska 99801

Subject: Gas Pipeline Impact Committee Meeting, February 17, 18, 19, 1976

Dear Senator Rader:

This is in reply to your letter of February 2, 1976 regarding possible consumption of natural gas in the city of Valdez.

If natural gas becomes available to the city of Valdez, a whole new era would be opened up. The natural gas would be utilized to heat homes, businesses, schools and hospitals, power electrical generation turbines, and for processing raw materials, minerals and other as yet unknown industries. The use of natural gas would replace the use of heating fuel for heating purposes, thus allowing the heating fuel to be utilized in other more economical ways.

While I have no idea as to the quantity of natural gas which would be consumed by a city of 10,000 to 15,000 people, I am certain it is considerable.

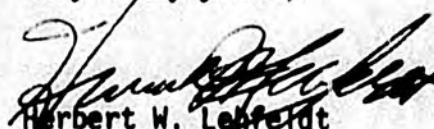
With the El Paso natural gas pipeline passing through the city of Valdez, it would be very inexpensive to construct a short service line into the city proper. The savings to the consumer would be fantastic just in transportation costs alone.

As soon as we become aware that the El Paso gas pipeline is to be built, the city administration of Valdez will immediately undertake the necessary steps to assure an adequate distribution system for the city.

The availability of natural gas to the citizens of this state is a vital necessity if the state is ever to become other than a consuming state. A low cost energy source is necessary if Alaska is ever going to be able to compete with other states in the production of consumer goods.

I urge you to exert every effort to assure that state royalty gas be retained for use within the state of Alaska.

Very truly yours,


Herbert W. Leffert
City Manager

HWL:ss



GOLDEN VALLEY ELECTRIC ASSOCIATION INC. Box 1249, Fairbanks, Alaska 99707, Phone 907-452-115

February 13, 1976

Senator John Rader, Chairman
Joint Gas Pipeline Impact Committee
Alaska State Legislature
Juneau, AK 99801

Dear Senator Rader

I recently read the Moody report and wholeheartedly concur with its recommendations.

There is a substantial potential market for natural gas available in Interior Alaska. GVEA will have 140,000 KW of base load type gas turbine capacity in operation by November 1977. These units, at nominal base load capacity would require approximately 25,000 cu. ft/day. Eight other reserve peaking units could be adapted to burn gas quite easily and would be if the economic analysis proved favorable. Our system plans to add an additional 100,000 KW of generation by 1980-81; therefore, by 1981 GVEA alone would be capable of using in the neighborhood of 50,000 cu. ft/day of natural gas. Other area steam/electric plants in combination would require about 30,000 cu. ft/day.

Further, I feel certain that Alyeska would consider burning natural gas at their pump stations 5 through 12 now scheduled to burn #2 distillate. These stations in combination phase 3 operation would use approximately 70,000 cu. ft/day.

Arrangements might be made to have them back off and go on liquid fuel as other industrial gas requirements and needs within the State developed.

It appears that this is one way that the State might initially utilize this valuable resource and more important, better guarantee its continued availability within the State of Alaska.

Best wishes.

Very truly yours

R. L. Huffman
General Manager

RLH:dee



ALASKA PIPELINE COMPANY

P. O. BOX 6386
ANCHORAGE, ALASKA 99502

3800 SPENARD ROAD
PHONE (907) 277-6661

February 16, 1976

Senator John Rader, Chairman
Joint Gas Pipeline Impact Committee
The Legislature of the State of Alaska
Juneau, AK 99801

Dear Senator Rader:

At your invitation we have rescheduled our travel in order to be present at this hearing, together with our consultant, Mr. Charles E. Smith. Charlie was the Alaska manager for Union Oil Company of California from 1959 to 1962, and later was their vice president for natural gas and gas liquids. He is now president of Transworld Gas Systems Inc., of Whittier, California. He has broad and thorough knowledge of the natural gas industry and its problems and prospects, and has assisted in preparing our position today.

We believe that it is essential and even imperative that the State should resolve not to let the Prudhoe Bay royalty gas become committed to or sold in interstate commerce and thus become subject to federal jurisdiction. Our review of the "Legal Analyses of Issues Relating to Natural Gas Transmission" as submitted by Rush Moody, Jr., strengthens this belief.

Based on our present sales and historical growth rate, we may have less than 10 years' supply remaining in our present contract for gas from the Kenai Gas Field. We are doing whatever we can to supplement these supplies: from Cook Inlet Royalty Gas; by negotiations for additional gas from existing uncommitted reserves in the Cook Inlet area; and by our own exploration program in the Susitna Valley. However, there is competition for all such gas reserves, from Japan and

ALASKA PIPELINE COMPANY**ANCHORAGE, ALASKA**

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February 16, 1976
Page Two

west coast cities, and it is apparent to us that existing Cook Inlet area gas sources will not be sufficient to supply all the existing demand for this gas. In fact, we can show that there is a projected deficit of about four (4) trillion cubic feet to the year 2000. This conclusion can be seen from the report (SRI Project ECC-4304) which Stanford Research Institute prepared in December 1975 for Pacific Alaska LNG Company. This deficit is approximately the same as the quantity of proven Prudhoe Bay royalty gas. In order to adequately protect the consumer, we do not believe it would be prudent for us, nor would it be in the public interest for the State, to rely on any but proven reserves as the future supply for use within Alaska. We do believe the State should view the Prudhoe Bay royalty as the best proven gas reserve for Alaskan use in future years, regardless of which route is selected for delivering this gas to market.

If the El Paso project is finally approved, which we favor, the alternatives open to the State are more straightforward. State gas can be removed from the pipeline prior to delivery to the LNG plant, and a pipeline connection can be made to the existing gas distribution system in Anchorage. In addition new distribution systems could be installed in any city within economic range of the line. Gas which is surplus to the needs of these distribution systems can be stored in underground reservoirs for future deliveries and peaking service, or converted to methanol fuel for distribution throughout Alaska, particularly as an alternative

ALASKA PIPELINE COMPANY**ANCHORAGE, ALASKA****Senator John Rader, Chairman****February 16, 1976****Page Three**

fuel for power generation. In our opinion such a plan would exempt the gas from the jurisdiction of the Federal Power Commission.

In the event the Canadian routing were to be chosen for Prudhoe Bay gas, there are several possible alternatives to be considered for the treatment and transportation of the royalty gas:

- (1) A small gas line might be laid to bring the gas to the vicinity of Fairbanks. After satisfying Fairbanks' needs, the remaining gas could be converted to methanol fuel or LNG for further delivery by appropriate means. Methanol fuel has equal or superior qualities as a fuel, and is also in demand as a petrochemical feedstock. Methanol fuel can be utilized as a liquid fuel replacing oil, with minimal equipment change out, but with combustion characteristics equivalent to natural gas. It would be an ideal peaking fuel for the gas turbines which supply power in Anchorage and Fairbanks. Thus even if the 7/8 of Prudhoe Bay gas is taken through Canada, the royalty could be used as fuel by many Alaskan communities and any excess could be sold in the world market. Methanol fuel could be transported by rail to Seward or Whittier for further delivery throughout Alaska. LNG might be exchanged with Pacific Alaska LNG Company for natural gas reserves in place in the Cook Inlet area.
- (2) The Prudhoe Bay royalty gas could be converted to LNG or methanol fuel at wellhead and delivered by Boeing 747 cargo aircraft. Trans-world Gas Systems has made studies in cooperation with Boeing which indicate that air movement of LNG is technically feasible for transportation from remote areas. Such a method adapts itself to small deliveries of gas into areas not yet being served. Further, LNG would be valuable as peaking fuel in the Anchorage area and it could provide base load fuel after the Cook Inlet reserves are depleted or otherwise committed.

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The cost of detailed evaluation and engineering of these alternatives cannot be justified unless or until it is known that the Canadian route will be chosen, and in such event there should be adequate time for the State to provide for handling of royalty gas by the time actual gas deliveries begin. However, as a precautionary measure we believe the State should retain the option to keep the royalty gas in place whether prior to completing its delivery facilities or during any "downtime" of these facilities after deliveries have started.

Regardless of the gas line routing decision, Prudhoe Bay royalty gas is a vital resource for Alaska, and control of its use should be reserved to the State rather than federal authorities. We do not believe that the State should allow even temporary deliveries into interstate commerce because of the danger in relying on existing regulatory and judicial precedents. Only by retaining the gas in place or by taking it as it is produced can the State maximize its opportunity to retain control. We urge the legislature to act now, before any commitment can be made or even presumed by federal authorities or by the applicant companies.

If adequate gas supplies should become available in the Cook Inlet area in the future and the Prudhoe Bay royalty thus becomes surplus, the State could at such time release it into interstate commerce.

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Senator John Rader, Chairman

February 16, 1976

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The foregoing is the only direct testimony we have at present. We would request that response to any questions be extended to include our consultant, Mr. Charles Smith of Transworld Gas Systems and Mr. Harold Schmidt, who is our senior vice president, and Mr. Bill Hickman, who is our management analyst.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Dale Teel".

Dale Teel
President

DT:jdh



ALASKA PIPELINE COMPANY

P. O. BOX 6288
ANCHORAGE, ALASKA 99502

3000 SPENARD ROAD
PHONE (907) 277-5551

February 9, 1976

Senator John Rader, Chairman
Joint Gas Pipeline Impact Committee
The Legislature of the State of Alaska
Juneau, Alaska 99801

Dear John:

In 1975 our sales were about 30 billion cubic feet (BCF), to military and civilian power plants and to all other uses, residential and commercial. At the end of 1975 we had 450 BCF remaining under contract. Recovery of waste heat and other reductions of demand for gas by the power plants can be projected, and we are not obligated to the military after 1980. However, it may be prudent for us to anticipate that our annual sales will increase by 1 BCF or more each year for the foreseeable future. Thus we should be working to obtain additional reserves at every opportunity.

We have not been negotiating for Prudhoe Bay royalty gas thus far, because royalty gas is now available in the Cook Inlet area and because there may be about as much other uncommitted gas in the Cook Inlet area as there is of royalty gas at Prudhoe Bay. The distance (investment) and the daily volume required for using Prudhoe Bay royalty gas have made it comparatively impractical for us to consider thus far.

We have begun exploring for gas in the Susitna Valley in the hope that reserves for our requirements could be found and thereby avoid the full impact of competition by Los Angeles, Portland, or Tokyo for gas from the Cook Inlet area. However, we need gas (not just "hope") and if Prudhoe Bay royalty gas will be available within 5 to 10 years, we believe we should begin considering it as an alternative or supplementary supply. As I read the material you sent me, it seems to be essential that the Prudhoe Bay royalty gas should not be commingled with producer gas regardless of the route selected, in order for the State to retain control of its gas. This would mean that a separate pipeline would have to be built for this royalty gas.

If the State were willing to do the financing of such a pipeline, and compressors as necessary, it may be possible for us to arrange to take part or all of the Prudhoe Bay royalty gas. I believe that a 20 inch (?)

ALASKA PIPELINE COMPANY

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pipeline, refrigerated to avoid permafrost problems, could be built along the oil pipeline right of way to the Fairbanks area and then along the new highway to the Anchorage area. It could serve the requirements of Chugach when their "Beluga" supply becomes inadequate, as well as our requirements particularly for the municipal and military power plants. It might also serve some of the requirements of present or future petrochemical industries. I am not sure what daily rate of royalty gas is being considered, but I assume it to be of the order of 100 to 200 million cubic feet per day, which compares to our present peak capacity of 160 million and our present average daily sales of about 75 million.

The seasonal aspect of our demand for gas may be the primary problem with our taking Prudhoe Bay royalty gas, but it may be possible to solve that problem by off-season industrial applications or other means. At any rate, we believe there may be sufficient prospect for Alaskan use of this gas that it should be fully explored.

We are not prepared to testify on February 17-20, and will be out of the state on those days. However, we believe our position should be considered as your committee studies this subject.

Very truly yours,



Dale Teel
President

DT:dh

BCF Billions of cubic feet

50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
900
950
1000

RESERVES
REMAINING
JAN 1 OF
EACH YEAR
(EXISTING SERVICE
AREA
ONLY)

CUMULATIVE
RESERVES
DEPLETED
JAN 1 OF EACH YEAR
(EXISTING SERVICE AREA ONLY)

RESERVES REMAINING JAN 1 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

USE OF NATURAL GAS IN ALASKA

BY

GEORGE C. SILIDES, P. E.

TO THE

SPECIAL LEGISLATIVE COMMITTEE ON

GAS PIPELINE IMPACT

FEBRUARY 17, 1976

I N T R O D U C T I O N

For the record, my name is George Silides. I am a Registered Professional Engineer in private practice, a former State Senator, and a member of the Eighth Legislature's Interim Natural Gas Pipeline Committee

Thank you Senator Rader, and members of the Ninth Legislature's Special Committee on Gas Pipeline Impact, for your invitation to appear before you and express my thoughts on the complex issues confronting you.

The Committee of which I was a member made three recommendations to the Legislature.

1. That a Special Legislative Committee be established in order to continue studying the alternative proposals of gas pipeline construction and routings, and to keep abreast of the actions of the Federal Power Commission and the Congress.

2. Obtain legal expertise in the area of Federal Power Commission regulation in order to protect Alaska's interests.

The creation of this Committee before which I appear today, and the retention of Mr. Rush Moody, formerly with the F.P.C., bears witness that the first two recommendations were accepted.

3. The third recommendation was that the State take such action as appears necessary so as to make it's position crystal clear. I am proceeding under the assumption that this Committee intends to move in that direction. To this date no clearly stated intent as to the use of our royalty gas or oil has been announced, nor has the Commissioner of Natural Resources invited specific, bona-fide, binding proposals from interested persons for the purchase and use of our royalty gas or oil. There is a partial legislative remedy for this as I shall suggest later.

Senator Rader, who chairs this Committee, invited me to speak on the uses of Natural Gas. Most of my comments will deal, primarily, with this aspect, but I would be remiss in not exploring with you some of the other considerations that relate and govern our ability to secure the use of the gas.

Many of my comments appear similar to those of Mr. Rush Moody. I make no apologies for this since I, and others, have been making these comments to the Legislature since 1972. It is encouraging to be joined in them by someone of Mr. Moody's reputation, experience, and a Washington, D.C. address, who gives us a much clearer insight than before as to what we might expect from the Federal Power Commission.

A M O U N T O F G A S

Prudhoe Bay reportedly contains 26 trillion cubic feet of recoverable cap and solution gas. Each barrel of oil produced will bring up about 750 cubic feet of solution gas. Therefore, 9.6 billion barrels of oil production may be expected to result in the concurrent production of 7.2 trillion cubic feet of solution gas. In terms of daily production 1.2 million barrels of oil results in 900 million cubic feet of solution gas and 2.0 million barrels per day results in 1.5 billion cubic feet of solution gas daily. This, I stress, is exclusive of any allowable cap gas production.

At 12 1/2% royalty interest, Alaska's share of solution gas amounts to approximately 185 million cubic feet of solution gas daily. When cap gas recovery is allowed for full pipeline throughput, Alaska's royalty share will rise to about 310 million cubic feet daily under the El Paso proposal, and 435 million cubic feet daily under the Arctic Gas scheme. The question immediately arises as to whether or not a pipeline through Canada is detrimental to Alaska's internal economies by depleting our royalty share at a rate faster than we can consume or convert to the myriad of products capable of being produced from Natural Gas. Add to this the certainty that the price of Natural Gas at the market place will continue to rise in relation to the cost of production; should cause us to consider net income just as important as production of the oil reservoir in determining the allowable rate of production.

ALLOWABLE RATE OF PRODUCTION

This is not to suggest that we should curtail solution and cap gas production below that which is necessary to comply with sound reservoir engineering. Nor do I subscribe to the simplistic, out-of-context, interpretation from a recent report to support the theory that we would lose 4 1/2 per cent of recoverable oil reserves unless all gas production was withheld to the year 2000 or so. Mr. O. K. Gilbraith and Mr. Pat Dobey of the Division of Oil and Gas are the ones to question on that account.

I am assuming that for about the first two years of oil production we will allow removal of about one half the solution gas and none of cap gas until the true nature of the reservoir and its flow pressures can be accurately determined by the State's Engineers. I mention these figures as significant because in point blank questioning, officials of El Paso claimed that they would be willing to proceed with construction even at this early-on reduced flow, while the larger diameter-different system of the Canadian line apparently cannot afford such curtailment. In other words, we tend to further lose control unless an Alaska route is used.

USES OF NATURAL GAS

We come now to the various uses of Natural Gas. Let me say at the outset that the least efficient use one can make of gas is to burn it simply for heat or to generate power. Product manufacture is much more beneficial. Through such latter use we not only provide high quality employment but we actually preserve the resource by conversion to a usable product.

It is at this point that I feel compelled to digress into discussion of another route which my associates and I consider of greater benefit to Alaska for reasons that will become apparent.

Thus far you have had two proposals - one through Canada and one through Alaska to Gravina Point. That latter route touches only one urban area - Fairbanks.

Let me also suggest an alternative route to Cook Inlet - specifically the Beluga area. By so doing, the following benefits accrue:

1. The resource is made accessible to the majority of the people of the State, not just 15%.
2. One of the telling criticisms levelled against the El Paso scheme by Arctic Gas is the almost 8% of the gas to be consumed in the liquification process. At Beluga, coal can be used to power the liquification pumps, thus conserving a valuable resource and materially

assisting the creation of a coal mining industry.

3. Methanol manufacture from our royalty gas can be used for the export of coal in slurry form, capable of being transported by tankers. Heretofore, water was used to transport crushed coal in pipelines. Upon arrival at the boiler, about 90-95% of the water content had to be removed. Using a methanol carrier, the slurry can be fired directly into the using boilers.

This, of course, is burning up the resource, not the most efficient use. But, at least, it has assisted in the formation of jobs and taxable income.

Methanol is a liquid chemical commodity of many uses. One important use is the manufacture of formaldehyde, from which are made synthetic adhesives for use in plywood, particle boards and in compressed wood - a superior substitute for scarce hardwoods. It also leads into a long chain of melamine plastics which can easily be manufactured in Alaska for export.

Other salient characteristics of products capable of large scale manufacture of products in Alaska are:

Amonia, urea and nitrates, needed in increasing quantities to sustain the world food supply. Alaska should become a major exporter of fertilizer. These products can be traded for imports which we need.

Nor should the agrarian potential of Alaska be ignored. Cattle ranchers on Kodiak Island and Aleutian Islands have been inhibited by the high cost of feed. The Tanana Valley is producing grain at more than twice the national average per acre. The key to successful cattle and swine raising in Alaska is abundant, cheap fertilizer. Gas is the raw material.

A particularly pure iron can be smelted continuously in the electric furnace, using gas or synthesis gas in place of coke. The tetaniferous iron ores of Klukwan and Snettisham can be smelted by this process in a clean manner.

Going quickly through a partial list of possible uses in Alaska for very large amounts of gas we find the following:

- Synthesis Gas
- Amonia
- Urea
- Nitric Acid
- Methanol
- Formaldehyde
- Lime
- Pelletized Ore and Iron
- Cement
- Acetylene
- Vinyl Chloride and Polyvinyl Chloride
- Nitrates
- Fertilizers
- Plastics
- Adhesives
- Residue Board and Compressed Wood
- Polypropylene, Polyethylene
- Styrofoam
- LNG

Also of importance is the availability of bottled gas to the smaller towns and villages which now suffer both high prices and fuel shortage problems. Obviously, these smaller communities cannot afford piped distribution systems.

We can see then, that gas derivatives such as ethane and propane can provide a substantial,, clean petrochemical industry in Alaska. Non-availability of feedstocks rather than cost retards petrochemical capacity. Investment is moving toward the oil and gas producing areas where feedstock availability can be assured. Examples are the Province of Alberta and British Columbia. Last year a 1.5 billion dollar ethane plant was announced in B.C.

C O N T I N G E N C Y P L A N

The question arises: "Can we have these things in the face of adverse ruling by the F.P.C., either in routing through Canada or attempted interference in our internal affairs." The answer is, "Yes, if we have a contingency plan."

First: Take the gas in hand. Make no commitment of sale to either pipeline, but retain control from the well head to the market place. Declare this intent by final passage of SB 174 on oil and gas. That Bill was introduced by the Senate Resources Committee at my request in 1974. It passed the Senate 18-2 and now resides in the House Resources Committee. If the Administration cannot make up its mind on this matter the Legislature can do it for them.

Do not, as has been suggested, amend the provisions of the statute giving legislative overview of the decision of the Oil and Gas Advisory Board. This Bill was co-sponsored in 1974 by Senator Silides, Senator Butrovich, Senator Poland and Senator Croft. It has proven the cornerstone of public scrutiny by the Legislature.

Second: In either routing, and especially if the line goes through Canada, negotiate a trade for our share of the Methane in exchange for Gas Liquids. This trade should be on a BTU equivalent.

Methane constitutes about 68 1/2 per cent of the gas produced at Prudhoe. The availability of Methane within the State is not as important as the availability of gas liquids, relatively speaking. It is the Methane that the mid-West cities are seeking to introduce into their distributor systems. Alaskan cities, with the exception of Anchorage and Fairbanks, do not warrant such distributor systems.

Ethane, Propane and Butane are more important to the State.

A. Bottled gas for rural use is needed to enhance the quality of life throughout the State.

B. The gas liquids are the main feedstocks for petrochemicals.

C. The gas liquids appear not to be subject to F.P.C. regulations.

D. The volume of gas liquids thus obtained could make a small diameter, high pressure pipeline possible from Prudhoe Bay to Tidewater. It most certainly bears study by the Committee.

C O N C L U S I O N

I could continue this complex discussion at even greater length, but I may have already exceeded my brief. My main purpose was first to indicate the value of the resource, and secondly, to suggest that avenues other than the very obvious remain open, and that they should be explored with a firm, positive action.



The ORGANIZATION for the MANAGEMENT of ALASKA'S RESOURCES, INC.

TESTIMONY PRESENTED BEFORE THE GAS LINE IMPACT COMMITTEE

FEBRUARY 17, 1976, JUNEAU, ALASKA

MY NAME IS BOB HARTIG, I SERVE AS ONE OF THE 49 FOUNDERS AND A MEMBER OF THE EXECUTIVE COMMITTEE FOR THE OMAR GROUP. WHILE OUR ORGANIZATION SEEKS TO PROMOTE THE WISE MANAGEMENT OF ALL ALASKA'S RESOURCES, FOR THE PAST 10 MONTHS, OMAR HAS BEEN DIRECTING ALL ITS EFFORTS TO ONE PROJECT--THE CONSTRUCTION OF A TRANS-ALASKAN, ALL AMERICAN NATURAL GAS PIPELINE RATHER THAN THE PROPOSED TRANS-CANADIAN LINE.

OMAR WELCOMES THE OPPORTUNITY TO SPEAK TO YOU AGAIN TODAY, AND COMMENDS YOU FOR YOUR CONTINUING INTEREST. WE ALSO WISH TO COMMEND THE COMMITTEE'S ACTION IN COMMISSIONING RUSH MOODY, JR. TO RESEARCH AND REPORT ON SOME OF THE MATTERS CONCERNING THE STATE'S RIGHT AND ABILITY TO CONTROL ITS NATURAL RESOURCES.

I DO NOT WISH TO RESPOND TO THE TECHNICAL QUESTIONS WHICH WERE POSED BY THIS COMMITTEE IN ITS CALL OF THIS HEARING BECAUSE OMAR IS NOT AN ENGINEERING FIRM. INSTEAD, WE ARE A GROUP OF CONCERNED CITIZENS AND, IT IS IN THE AREA OF PUBLIC POLICY THAT WE FUNCTION.

MOST IMPORTANT OF THE THREE POINTS WE WISH TO MAKE TODAY IS THAT WE ARE DETERMINED TO SEE THE GAS LINE BUILT THROUGH ALASKA. OUR REASONS ARE BOTH ECONOMIC AND ENVIRONMENTAL. IT MAKES SENSE TO USE THE CONTINUED DEVELOPMENT OF ALASKA'S RESOURCES TO KEEP UNEMPLOYMENT RELATIVELY LOW. IT MAKES SENSE TO KEEP OUR RELATIVELY PROSPEROUS ECONOMY AT THE CURRENT LEVEL. IT MAKES SENSE TO USE THE EXISTING ROADS, CONSTRUCTION CAMPS, LANDING STRIPS AND COMMUNICATIONS

FACILITIES AS MUCH AS POSSIBLE FOR A GAS LINE ONCE THE ALYESKA LINE CONSTRUCTION IS COMPLETED IN ORDER TO REDUCE ENVIRONMENTAL DAMAGE AND REDUCE LOADING COSTS.

IN ADDITION TO BEING VITALLY AFFECTED BY THE COSTS OF THE TRANSPORTATION SYSTEM FOR THE NATURAL GAS, ALASKANS ALSO DESERVE THE OPPORTUNITY TO USE THE ROYALTY SHARE OF THE GAS - 12½% - TO MAXIMIZE ECONOMIC BENEFITS TO THE ENTIRE STATE.

THEREFORE WE RECOMMEND THAT THE MEMBERS OF THIS COMMITTEE CONSIDER TAKING THE FOLLOWING ACTIONS:

1. REQUEST THAT THE ADMINISTRATION NOTIFY ALL HOLDERS OF THE PRUDHOE BAY OIL AND GAS LEASES THAT THE STATE ELECTS TO TAKE ITS ROYALTY GAS IN KIND.

2. TO INSURE CONSTRUCTION OF THE TRANS-ALASKA PIPELINE, CONSIDERATION SHOULD BE GIVEN TO THE PRESENT SALE OF THE ROYALTY GAS TO THE FIRM WHICH WILL BUILD SUCH A LINE. SUCH A COMMITMENT OF ROYALTY GAS TO A TRANS-ALASKA PIPELINE WILL SUBSTANTIALLY HELP BRING THAT LINE INTO BEING.

3. WHILE IT IS RECOGNIZED THAT MOST GAS SALES CONTRACTS ARE NORMALLY LONG TERM CONTRACTS, AN EFFORT SHOULD BE MADE TO OBTAIN A RELATIVELY SHORT TERM SALE. PROVISIONS SHOULD ALSO BE MADE IN THE ROYALTY GAS SALES CONTRACT TO WITHDRAW CERTAIN PERCENTAGES OF THE GAS THROUGHPUT TO PROVIDE FOR NEEDS OF COMMUNITIES ALONG THE PIPELINE ROUTE, INCLUDING THE FAIRBANKS AREA. WHILE THESE EXACT NEEDS MAY NOT BE DETERMINABLE, IT IS SUBMITTED THAT PROVISIONS WHICH WOULD PERMIT INCREASING PERCENTAGE WITHDRAWALS OVER THE PERIOD OF THE SALES CONTRACT WOULD MEET THE INCREASED DOMESTIC AND INDUSTRIAL DEVELOPMENT NEEDS AS THEY BECOME IDENTIFIABLE.

THE RECOMMENDATION TO SELL THE STATE'S ROYALTY GAS IS BASED ON THE RECOGNITION OF THE FOLLOWING:

1. ALASKA HAS NO IDENTIFIABLE USE FOR THE GAS.
2. AMOUNTS OF FLOW ARE STILL UNDECIDED WITH INITIAL FLOWS BEING DETERMINED BY THE ALASKA OIL AND GAS CONSERVATION COMMITTEE ON PROJECTIONS. THESE FLOWS WILL LATER BE ADJUSTED BASED ON EXPERIENCE OF PRODUCTION.
3. ONLY AFTER THE PRODUCTION SCHEDULE IS ESTABLISHED CAN A FIRM DETERMINATION BE MADE OF HOW TO BEST MEET THE NEEDS OF OUR COMMUNITIES, AND POSSIBLE PETROCHEMICAL DEVELOPMENT.
4. PETROCHEMICAL DEVELOPMENT NORMALLY REQUIRES LEAD TIMES OF BETWEEN 5 AND 10 YEARS.
5. FUTURE DISCOVERIES WILL BE AVAILABLE TO MEET FUTURE NEEDS.

WE FEEL THIS PROGRAM RECOGNIZES THE NECESSITY OF HAVING THE STATE'S ROYALTY GAS AVAILABLE FOR USE WITHIN THE STATE AND THE IMPORTANCE OF UTILIZING THE AVAILABILITY OF THE STATE'S ROYALTY GAS AS A WEAPON IN GETTING THE PIPELINE BUILT THROUGH ALASKA.

AS TO THE SPECIFIC QUESTIONS POSED BY YOUR COMMITTEE IN YOUR LETTER OF JANUARY 30, 1976:

(1) (a) WE ARE IN AGREEMENT WITH MR. MOODY'S LEGAL ANALYSIS. PRELIMINARY RESEARCH CONDUCTED BY OMAR PERSONNEL TOGETHER WITH INFORMATION GAINED IN MEETINGS WITH OUR CONGRESSIONAL STAFFS AND PERSONNEL WHO POSSESS AN EXPERTISE IN FPC MATTERS, HAS ALREADY CONVINCED US OF THE NEED TO ESTABLISH A NATURAL GAS POLICY FOR THE STATE AND THE IMPORTANCE OF AND THE ACCURACY CONTAINED IN MR. MOODY'S LEGAL ANALYSIS.

(b) MOST OF MY STATEMENT HAS BEEN DIRECTED TO ANSWERING THIS. HOWEVER, WE WOULD URGE THAT STATE LEGISLATION ALTER TAXATION AND LEASING STATUTES TO PROVIDE INCENTIVES TO THOSE PRODUCERS WHO UTILIZE THESE RESOURCES

45
WITHIN THE STATE.

(2) RESERVOIR RECOVERY IS BEYOND OUR PROVINCE. HOWEVER WE WOULD EMPHASIZE THE QUALIFICATIONS PLACED ON THE STUDY BY THE CONTRACTOR AND THE STATE. THAT IS, THAT "RESERVOIR PERFORMANCE PREDICTIONS ON A FIELD WITHOUT PRODUCTION HISTORY ARE APPROXIMATE AT BEST". AND IN ADDITION, WE WISH TO CALL ATTENTION TO THE FACT THAT ARCTIC GAS HAD RECOVERY PROJECTIONS SIMILAR TO THE STATE, YET ACCORDING TO A NEWS REPORT FROM THE OTTAWA JOURNAL, THE CONSORTIUM STILL INTENDS TO BUILD A PIPELINE SYSTEM LARGER THAN NEEDED, IN EXPECTATION OF TRANSPORTING FUTURE GAS FINDS THROUGH THAT SAME LINE. THIS MEANS THE INITIAL TRANSPORTATION COST WOULD BE HIGHER THAN NECESSARY, AND THE RESULTANT RETURN TO THE STATE OF ALASKA LOWER THAN IT SHOULD BE.

(3) REGARDING PROSPECTIVE PURCHASERS FOR THE ROYALTY GAS, AND USES WITHIN THE STATE, WE FEEL CONFIDENT THAT ONCE A GIVEN QUANTITY OF GAS AND DATE OF AVAILABILITY IS DETERMINED, THERE WILL BE NO LACK OF PURCHASERS FOR PETROCHEMICAL USE. BUT ALL OF THAT IS MOOT IF WE DO NOT DEAL WITH THE GAS AS A WEAPON IN GETTING THE GAS LINE BUILT THROUGH OUR STATE.

IN SUMMARY:

(1) ONLY WITH A TRANS-ALASKAN NATURAL GAS PIPELINE WILL THE STATE BE ASSURED OF THE OPPORTUNITY TO RETAIN ITS ROYALTY SHARE FOR FUTURE DOMESTIC AND INDUSTRIAL USES.

(2) IN ORDER TO ENSURE THE APPROVAL AND CONSTRUCTION OF A TRANS-ALASKAN PIPELINE THE DISPOSITION OF THE STATE'S ROYALTY GAS SHOULD BE USED AS A WEAPON. IN THAT REGARD, AND, RECOGNIZING THAT THERE IS PROBABLY NOT A PRESENT IDENTIFIABLE NEED FOR THE GAS, THE STATE SHOULD : (1) NOTIFY ITS OIL AND GAS LESSEES OF ITS PRESENT ELECTION TO TAKE ITS ROYALTY SHARE IN

KIND (2) ARRANGE FOR SHORT TERM SALES OF THE ROYALTY GAS IF POSSIBLE OR
IN THE ALTERNATIVE, LONG TERM SALES WITH PROVISIONS TO ACQUIRE INCREASE
PERCENTAGES ON A FIXED SCHEDULE.

IN ADDITION:

(3) THE LEGISLATURE SHOULD CONSIDER LEGISLATION WHICH WOULD ALTER
FUTURE LEASES FOR OIL AND GAS TO PROVIDE INCENTIVES FOR UTILIZING THESE
RESOURCES WITHIN THE STATE.



February 17, 1976

Senator John Rader
Chairman, Joint Gas Pipeline Impact
Committee
The Legislature Of The State Of Alaska
Juneau, Alaska 99801

Dear Senator Rader:

We appreciate having an opportunity to submit our comments on your letter of January 30, 1976, soliciting testimony on the Rush Moody Report, the State's Reservoir Analysis and Royalty Gas Options. We will also respond herein to your letter of January 15, 1976, asking five questions regarding the recently published Department of Natural Resources Study on Sadlerochit Reservoir Conservation.

At the outset, there are a few things that should be said about the position of BP Alaska in these matters. By means of its 1969 agreement with Standard Oil Company (Sohio) BP Alaska conveyed its working interests in the oil and gas leases in the Prudhoe Bay area to Sohio reserving to BP Alaska a seventy-five percent net profits royalty interest from production from the Prudhoe Bay properties attributable to production in excess of a certain level. The effect of this agreement is to make Sohio the working interest owner of all the gas under the Sohio/BP leases in Prudhoe Bay. The same agreement made BP Alaska the operator of the Sohio interests in Prudhoe Bay.

The BP Alaska net profits royalty interest does not come into play until production of oil reaches levels in excess of approximately 1,200,000 barrels per day. It will be recalled that this is the level of production which the Trans Alaska Oil Pipeline will be capable of handling under current authorization.

Senator John Rader

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Since the BP Alaska net profits royalty interest in gas is triggered by certain criteria of sustained oil production of specified volume and at specified times, it will be seen that the BP gas interest is of small magnitude in comparison with the interests of the principal gas working owners in the Prudhoe Bay Field which are ARCO, EXXON and SOHIO.

BP Alaska has entered into an agreement with Northern Natural Gas Company giving that company the option to purchase the as yet undefined volumes of gas that may be attributed to BP Alaska through BP Alaska's net profits interest agreement up to a maximum volume of three trillion cubic feet. It should be noted that the Northern Natural Gas agreement covers not only gas from Prudhoe Bay but also any other gas which is attributable to BP Alaska and which may be produced from other North Slope oil and gas leases owned by Sohio and BP.

BP has further agreed with Columbia Gas Transmission Corporation to make available to that company any BP gas which is not required to satisfy its undertaking with Northern Natural Gas.

BP Alaska has not entered into any agreements which concern the basis or method of transport of the gas which the above two companies have the option to purchase or in respect to any other gas that may be available to our company on the North Slope. BP Alaska has no intention of participating in the construction of a gas line nor of assisting in the financing of such a venture. BP Alaska is not aligned with the proponents of either of the two principal schemes for transportation of Prudhoe Bay gas. Our role is simply that of a producer of gas.

The Moody opinion represents a very substantial exercise in legal scholarship involving a number of complex legal issues. As the author concedes, it also raises issues which involve rather longer term implications than the immediate question of the State's disposition of royalty gas and the alignment of the gas pipeline.

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February 17, 1976

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We can not responsibly endorse or reject an effort of this magnitude without comparable research and analysis. We understand the State's concern with its ability to control the disposition of its royalty gas in the light of Federal law and regulation. We believe the Moody Report is correct in its conclusion that the State should decide as quickly as possible the ultimate goals of the State's natural gas policy. If the State determines that it is in its best interest to attempt to retain a portion of Alaska's gas for future Alaskan needs, we agree with Mr. Moody's recommendation that positive action must be taken before the gas has been committed to interstate commerce. Such participation could include, as Mr. Moody suggests, active involvement by the State in transportation negotiations with the Federal Power Commission.

With respect to the possible changes in the State's leasing and taxing policies, discussed by Mr. Moody, the discussion centered as much on questions of policy as on legal issues. In view of the complexity of the policy and legal issues which might be presented by novel taxation proposals and suggested changes in the State's leasing laws and regulations, we propose to defer comment until the committees of the legislature meet to consider specific proposals incorporating such changes.

We now turn to your letter of January 15, 1976, which poses questions arising out of the State's recent study on the Sadlerochit Reservoir. For ease of reference we set out below the questions and our answers.

1. What effect does the recent study, "Prediction of Reservoir Fluid Recovery Sadlerochit Formation Prudhoe Bay Field", have on marketing plans for Prudhoe Bay gas?

The State study evaluated several possible reservoir management schemes and indicated the relative effect of each hypothetical case. The results are not inconsistent with our anticipation that a practical reservoir management scheme can be implemented that will allow gas offtake from the field at rates of the order of 2 bscf/d sales.

Senator John Rader

February 17, 1976

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2. How does this study differ from industry and federal studies?

Published studies have predicted various production characteristics, consistent with the available detail and reliability of the data applied. It is to be expected that slightly differing results will be found in these circumstances, but generally the same relative effects of reservoir management schemes are to be found.

3. How accurate can a model be without production history?

Model studies incorporate many uncertainties with or without any production history. They are certainly more reliable when production history is available for calibrating the various input parameters. They can be considered to be reliable as to general performance and are specifically valuable in assessing relative effects due to varying reservoir production schemes. Good reservoir management planning recognizes and allows for these uncertainties.

4. Will some production history be necessary before an accurate model is established that will prove feasibility of a gas pipeline for marketing of Sadlerochit gas?

We believe it is possible to plan now for a reasonable level of gas offtake from the field, recognizing that the actual circumstance that results during production may need some modification to the reservoir management, particularly with regard to pressure maintenance, to continue to effectively produce the field.

5. How critical are the results of this study in obtaining FPC certification and financing for the gas pipeline project?

Senator John Rader

February 17, 1976

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5. The above remarks indicate that we believe it is feasible, under a satisfactory reservoir management scheme, to plan for sustained gas sales. As a potential producer, it is not our principal expertise to comment on the gas marketing or financing questions. These could be more authoritatively answered by the gas pipeline/marketing companies.

In conclusion, we do not believe that the recently published State of Alaska Department of Natural Resources Study nor the lack of production history should adversely affect the F.P.C. decision on the certification of a pipeline.

BP Alaska did not participate in the F.P.C. proceedings and has not been asked to respond to the interrogatories set out in the F.P.C. letter dated December 12, 1975. We have, however, testified at the hearings of your committee held on December 10, 1975, in Anchorage and at that time responded to some of the same questions included in the F.P.C. interrogatories.

It may be useful for you to be aware of answers we shall be providing to questions posed by the Senate Interior and Insular Affairs Committee and the Senate Commerce Committee under cover of a letter dated January 27, 1976, from Senators Warren G. Magnuson and Henry M. Jackson. A copy of the above letter and the referenced questions are enclosed for your convenient reference together with a draft of BP Alaska's response to those questions. The BP response is in the form of an internal memorandum dated February 12, 1976, to J. Gore of BP Alaska's Washington, D.C. office from D. B. Walker who is Vice President, Production Planning for BP Alaska.

If the Committee should desire further information on these or other matters during our new deliberations we will make every effort to respond.

Sincerely,



K. R. Keep
Vice President and General Manager

Enclosure

United States Senate

WASHINGTON, D.C. 20510

January 27, 1976

Mr. John Gore
Manager, Government Affairs
B. P. North America, Inc.
1730 M Street, N.W.
Washington, D.C. 20036

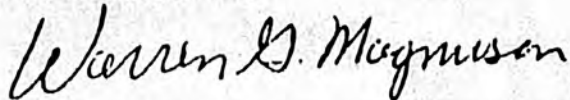
Dear Mr. Gore:

The Senate Interior and Insular Affairs Committee and the Senate Commerce Committee are examining the extent of Arctic natural gas reserves and alternative transportation systems for delivery of this gas to markets in the lower 48 states. The Committees are also examining the institutional, resource and other factors which may constrain or significantly influence the cost of this natural gas and the timing and mode of its delivery into the existing distribution system.

To facilitate our respective Committees' consideration of this matter and to develop the factual background relevant to major policy decisions respecting the development of Alaskan natural gas, our Committees request that you respond to the issues raised in the attached questionnaire by Parts I.A.; I.B.(1), (2), (3) and (6); II.A.(3), (a) and (b); and II.B.(2), (a), (b), (c) and (d). We would appreciate delivery of five copies of your response to these questions to the Interior and Commerce Committees no later than February 11, 1976.

For further information, please contact Henry Lippek at 224-9351 or Thomas Platt at 224-0611.

Sincerely yours,



WARREN G. MAGNUSON, Chairman
Committee on Commerce



HENRY M. JACKSON, Chairman
Committee on Interior and
Insular Affairs

94th Congress }
2d Session }

COMMITTEE PRINT

ISSUES CONCERNING
THE TRANSPORTATION OF
ALASKAN NATURAL GAS

QUESTIONNAIRE

PREPARED FOR THE
COMMITTEES ON
INTERIOR AND INSULAR AFFAIRS
AND
COMMERCE
UNITED STATES SENATE



JANUARY 1976

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65-042

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(17)

MEMORANDUM OF THE CHAIRMEN

In February 1976, the Senate Committee on Interior and Insular Affairs and the Senate Committee on Commerce will conduct joint oversight hearings on Arctic natural gas reserves and alternative transportation systems for delivery of this gas to markets in the lower 48 states. The Committees will examine the institutional, resource and other factors which may constrain or significantly influence the cost, timing and mode of delivery of this natural gas into existing distribution systems.

To facilitate our respective Committee's consideration of this matter and to develop a factual background on the major policy decisions respecting Alaska gas, interested persons are invited to respond to all or any of the attached questions by February 11, 1976.

Materials submitted will be included in the hearing record on this matter.

HENRY M. JACKSON,
Chairman, Committee on Interior and Insular Affairs.
 WARREN G. MAGNUSON,
Chairman, Committee on Commerce.
 (11)

I. ASSESSMENT OF NATURAL GAS SUPPLIES

A. NATURAL GAS SUPPLIES

- ✓(1) What are the current estimates of proven reserves in:
 - (a) the Sadlerochit formation of the Prudhoe Bay field,
 - (b) other formations in the Prudhoe Bay field,
 - (c) reserves elsewhere in Arctic or Interior Alaska, or on the Arctic OCS, and
 - (d) the Mackenzie Delta and adjacent Canadian onshore and offshore areas.

- ✓(2) What additional reserves can reasonably be expected to be discovered and produced from each of these areas by 1985?

- ✓(3) What is the range of uncertainty and/or dispute in each of the estimates in questions 1 and 2 above:
 - (a) resulting from geological or engineering uncertainty,
 - (b) depending on leasing or resource development policies, or
 - (c) resulting from uncertainty about other factors (economic incentives, industry response, logistical problems, etc.)?

- ✓(4) What are the potential natural gas resources in each of the areas identified in question (1) and the likelihood of their producibility in volumes which could influence the viability or relative merits of alternative systems for delivery of Prudhoe Bay natural gas?

- ✓(5) Consider specifically what leasing or development policy regarding the Alaska outer continental shelf, Naval Petroleum Reserve No. 4, the Arctic Wildlife Range, state lands and lands controlled by Alaska Native corporations might be necessary to make viable various alternative transportation systems? Consider also the possibility of major discoveries in Lower Cook Inlet, the Gulf of Alaska, or other areas of Alaska, and their implications for the viability or merits of alternative transport systems?

B. DELIVERABILITY AND COST

- ✓(1) What levels of natural gas production could each of the areas considered in subpart A above reasonably be expected to support in each year 1980 through 1985, if transportation were available, given due allowance for the time necessary for field development?

(1)

estimates? Consider particularly the relationship between crude oil recovery and natural gas production from the Prudhoe Bay field.

57 ✓(3) The Van Poolen study for the State of Alaska implies that the potential tradeoff between gas and oil production from the Sadlerochit formation will not be known until

(a) tests have been made of the ability to inject water into the reservoir and a source of water has been assured, and

(b) the operation of the aquifer underlying the reservoir has been observed during oil production.

Is this inference correct? If not, can the optimum rate of gas production presently be calculated? If so, what is it? If the inference is correct, when are the earliest and latest dates that enough information might be available to make a prudent decision on the rate of gas production and the system to transport such natural gas

(4) (a) What is the statutory mandate and policy of the oil and gas conservation authority in Alaska with respect to optimizing the joint production of oil and gas?

(b) To what extent is there a requirement or authority for the agency or the State to consider economic or development factors (as opposed to physical conservation alone) in regulating field production levels?

(5) (a) Could the rates of production at Prudhoe Bay now contemplated by the applicants in Docket CP-75-96 before the Federal Power Commission be appreciably reduced by actions of the State of Alaska?

(b) When will the Alaskan conservation agency decide on the allowable rate of natural gas and oil production?

(c) Can its initial decision be later modified?

(d) Is there a conflict between the FPC's certificating authority and the State's conservation authority? If so, which authority would prevail?

✓(6) What is the anticipated cost (not necessarily equal to price) of Prudhoe Bay natural gas at the wellhead? Please supply the assumptions and detailed back-up for such estimates. Specifically:

(a) Are these calculations incremental costs, assuming that all joint costs of lease acquisition and field development are borne by oil production, or do they assume an allocation of such joint costs to gas production; and

(b) Does the cost estimate include the value of oil production forgone, if any?

A. ANTICIPATED SHORTAGES

In the absence of the Alaskan gas, what are the anticipated natural gas shortages in the lower 48 states by region in the 1980-85 period?

(1) Which pipelines are expected to be in deepest curtailment or priority users in that period? What is the range of uncertainty associated with these estimates?

(2) What is the anticipated intrastate demand for natural gas in Alaska during the 1980-85 period?

(a) How much of the Prudhoe Bay gas is planned to be consumed in Alaska?

(b) To what extent do these projections of Alaskan consumption assume natural gas use for boiler fuel and other uses for which oil or coal could be substituted?

(c) How much do these estimates vary with different assumptions concerning natural gas and oil prices?

✓(3) Which pipelines or distributors have options to purchase Alaskan natural gas at this time?

✓(a) Would the same pipelines and distributors obtain Alaskan natural gas regardless of whether the Arctic Gas or the El Paso project are approved?

✓(b) What are the terms and conditions of these options to purchase?

(c) If Prudhoe Bay gas were to be sold to the pipeline systems in greatest need on the basis of the best current projections pursuant to the FPC's current curtailment policy, which pipelines would receive the gas and what quantity would be sold to each?

(d) On what terms would non-transportation system owners have access to the Alaskan gas transportation system?

(4) The State of Alaska has not yet committed its royalty share of the Prudhoe Bay gas to sale or options. Will the State's decision regarding disposition of its royalty gas (a), between interstate and intrastate purchasers, or (b) among interstate purchasers, significantly influence the viability or the FPC's evaluation of alternative transportation systems?

B. PRICE

(1) Is the demand for Alaskan natural gas sensitive to natural gas prices and to the price of alternative fuels in the lower 48 states?

✓(2) When do the producers and purchasers intend to enter into firm long-term contracts for the sale of the Prudhoe Bay natural gas?

✓(a) What is the reason for the delay to date?

✓(b) What price will the producers receive in the absence of FPC price controls?

✓(c) What will be the duration of the sales price?

✓(d) What are the other likely major terms of such contracts?

(3) For the two transportation systems proposed by the applicants and the modifications recommended by the FPC environmental staff, what are the anticipated:

(a) capital costs (in 1975 dollars);

(b) the initial total transportation tariff per Mcf delivered to points on the West Coast, in the Midwest and in the East; and

(c) the total transportation tariff per Mcf delivered to such destinations 13 years after initial delivery?

(4) Are current estimates realistic in light of the large cost overruns that recently have characterized major construction projects like the TransAlaska oil pipeline, the Washington Metro or nuclear generating plants? To what extent do the current cost estimates take into account the likelihood of materials shortages, failure to perform by certain contractors, defects or late delivery of equipment, labor disputes, unusually severe weather, regulatory delays, etc.? If the experience of the Alaskan oil pipeline and all these factors are taken into consideration, what is the magnitude of total system costs (in both current dollars and 1975 constant dollars) that conceivably could be expected?

(5) To what extent does transportation at each system's design capacity depend upon additional discoveries of new reserves? What is the range of anticipated total capital and operating costs per Mcf at various levels of throughput?

6. (a) What is the size of the market for Alaskan gas in the lower 48 states if its average lower 48 city gate price (in constant 1975 dollars) is \$2.00 per Mcf? \$2.50 per Mcf? \$3.00 per Mcf? \$4.00 per Mcf? \$5.00 per Mcf? What is the assumed oil price in these estimates?

(b) At each average price what portion of the total gas over the course of a year would be consumed by priority users, (residential and commercial) and at what price; and what portion would have to be sold for boiler fuel or as interruptible supply, and at what price?

(7) What would be the impact on demand for Alaskan gas if its price at the city gate were substantially higher than the equivalent average price of oil? At what price per Mcf would pipelines no longer be willing to purchase Alaskan gas? What is the probability and under what circumstances, taking into account production costs, all tariffs

and taxes, that the price of Alaskan gas would exceed the amount purchasers are willing to pay for an equivalent volume of base load supply?

Please provide the estimates requested in questions (6) and (7) on the alternative assumptions that Alaska natural gas is required to be priced (1) incrementally or (2) on a "rolled in" basis.

C. COST OF DELAY

(1) What revisions must be made in project costs for each year of delay (up to five years) in the commencement of construction?

(2) What is the best estimate of the total cost to consumers for each year of delay beyond 1980 in terms of the price of alternative fuels or impact on the economy of a gas shortage?

III. STATUS OF REGULATORY APPROVALS

A. AGENCIES INVOLVED

List all of the Federal and state agencies which must issue permits or approvals as a prerequisite to the construction or operation of an Alaskan gas transmission system.

(1) State the estimated timetable for the applicants to obtain such approvals in the absence of expediting legislation.

(2) Is it possible or reasonable for the FPC to grant a certificate for any gas transportation system before the deliverability issues identified in subpart I, B are resolved?

(3) State any approvals required after the FPC issues a certificate of public convenience and necessity. Can the necessity of any such approvals delay or even prohibit construction of the system?

(4) Identify the possibilities for slippage and delay in the timetable for the FPC and other agency approvals?

B. FEDERAL-STATE RELATIONS

(1) Are Federal and state approval processes coordinated?

(2) Is there a potential for conflict between state land-use, coastal zone management, construction, conservation, safety and other regulatory or taxation activities and Federal requirements and permits?

(3) What is the mechanism, or what mechanism should be established, for encouraging early state input and resolving differences between Federal and state policies?

C. JUDICIAL REVIEW

(1) Which Federal or state agency decisions regarding the transportation of Alaskan gas are the likely subjects of judicial review? What is a reasonable estimate of the time required to complete such judicial review of agency decisions? Could construction commence while such judicial review was underway?

(2) In the absence of any legislation, what is the expected date on which construction could commence? Be completed?

D. ALTERNATIVES

Please provide estimates of the costs, environmental impacts, construction lead times and other relevant facts concerning:

(1) An alternative pipeline route from the North Slope to Fairbanks and then paralleling the Alcan Highway;

(2) Conversion of natural gas to methanol and shipment by the trans-Alaska oil pipeline or tanker or submarine; and

(3) Other possible alternatives.

E. SAFETY

What are the design and operation techniques to assure safe and continuous operation of Alaskan natural gas transportation systems?

1. What is the relationship between the Federal Power Commission and the Department of Transportation with respect to safety standards during gas pipeline construction and operation?

2. What are the probable and worst case estimates of injury and damage of natural gas pipeline accidents?

3. Which State and/or Federal agencies have jurisdiction over LNG terminal siting with respect to safety, distance from population centers, and ship traffic control?

4. What plans or procedures have the responsible agencies or the applicant devised to prevent or deal with LNG tanker collisions or other LNG handling accidents? What is the best available technology to minimize the risk of an LNG accident and to deal with serious LNG accidents?

5. What are the probable and worst case estimates of injury and damage that could result from an LNG tanker or terminal accident? What are the owners' liabilities for such an accident? Are existing liability laws adequate to provide compensation for all damages resulting from a probable and worst case accident?

F. CANADIAN PROCEDURE

(1) What is the status of Canadian proceedings regarding the Arctic Gas and Maple Leaf projects? What is the anticipated schedule for final approvals by the National Energy Board and the Cabinet? What approvals are required by Provincial Governments? Are there other opportunities for delay of a Canadian decision, such as settlement of Canadian native claims? What is the best estimate of when the Canadian Government will reveal whether a trans-Canada route to transport Alaskan gas is acceptable to Canada?

(2) To what extent does the Canadian decision in fact await or depend upon a decision by the United States?

(3) What diplomatic channels or other mechanisms are available to assure coordination of the U.S. and Canadian approval processes? How would differences be resolved if incompatible trans-Canada routes are approved in the U.S. and Canada?

G. TREATY STATUS

(1) What is the anticipated initialling date for the U.S.-Canadian pipeline treaty?

(2) What are the terms of the draft treaty?

(3) Would the treaty limit or restrain the taxation or regulatory authority of state or Provincial governments?

(4) What other issues remain to be resolved in a specific protocol dealing with an Alaska-Canada transmission system?

IV. FINANCING

A. PRIVATE CAPABILITY

(1) Do private capital markets have the capability to provide the necessary funds for the construction of an Alaskan gas transportation system? Can the equity capital for this project be attracted solely on the basis of regulated revenues from natural gas consumers? What is the anticipated interest rate at which needed long-term debt capital can be raised?

(2) Assume the project encountered substantial cost overruns. Could it still be financed privately? What are the outer limits of the amount of capital that could be privately raised?

B. SUBSIDIES

(1) To what extent are either of the applicants intending to seek Federal subsidies, loan guarantees or other forms of financial assistance to offset costs or provide cost overrun protection?

(2) Can either project be constructed and operated without any such Federal assistance?

(3) If Federal assistance to protect against cost overruns is required, what incentives can be incorporated to give the successful applicant incentives to minimize costs?

(4) If a project requiring LNG transportation is certified:

- (a) How many vessels would be needed?
- (b) Where would such vessels be constructed?
- (c) What is the amount of subsidies or loan guarantees likely to be requested?

C. TARIFFS

(1) Is it anticipated that Alaskan gas will be sold pursuant to an all-events full cost of service tariff whereby rates are automatically adjusted to reflect any costs incurred and are paid by purchasers whether natural gas is delivered or not?

(2) What is the anticipated risk that gas deliveries will be interrupted over the life of a project?

(3) Is the private financing of the Alaskan gas transportation system contingent upon state and Federal approval of such an all-events tariff?

(4) Are there precedents for an all-events tariff in other situations?

(5) What is the likelihood that state public utility commissions would approve natural gas purchases conditioned upon such tariffs?

(6) Can purchasers obtain insurance from private markets to insulate them against financial difficulties if gas deliveries are interrupted?

(7) If the risk of interruption is significant, would it be prudent to limit the percentage of Alaskan gas entering any pipeline or distribution company?

V. LEGISLATION

(1) What legislation, if any, is required to facilitate the construction of an Alaskan natural gas transportation system?

(2) What subjects should such legislation address? Consider and comment on such matters as:

- (a) an expedited schedule for FPC action;
- (b) a narrowing of judicial review in time and scope;
- (c) establishment of a Congressional review process;
- (d) congressional selection of one or more routes by directing all involved federal agencies to expeditiously grant all required permits and licenses;
- (e) establishment of wellhead price ceilings and tariffs for Alaskan gas;
- (f) establishment of a consolidated administrative process for the siting of LNG facilities;
- (g) basis for and extent of an LNG vessel owner's liability for damages in the event of accident;
- (h) provision for financial assistance to assure project construction;
- (i) providing for allocation of Alaskan gas to pipeline systems in greatest need;
- (j) resolution of environmental issues associated with the transportation of Alaskan gas; and
- (k) other matters.

February 12, 1976

TO: J. Gore - Washington, D.C.

FROM: D. B. Walker - San Francisco, CA

Response to questions regarding "Issues Concerning the Transportation of Natural Gas":

I.A.1. (a) The current estimate of proven reserves of gas in the Prudhoe Bay pool, consisting of the closely related Sadlerochit, Sag River and Shublik Formation, is 24 trillion cubic feet.

(b) No other hydrocarbon-bearing formations in the Prudhoe Bay field are, at this time, considered to contain proven reserves of gas.

(c) & (d) BP Alaska does not have sufficient data to establish whether proven reserves of gas exist elsewhere in Arctic or interior Alaska or on the Arctic OCS or in the Mackenzie Delta and adjacent Canadian onshore and offshore areas.

I.A.2. BP Alaska does not have sufficient data available to make any reasonable prediction of the volume of additional gas reserves that may be discovered and produced from these areas by 1985.

I.A.3. (a) Geological and engineering data would suggest that the uncertainty in the reserves estimate given in I.A.1. (a), above, is approximately $\pm 15\%$.

(b) & (c) As we are unable to make any reasonable prediction of the volume of gas reserves in areas other than in the proven acreage of Prudhoe Bay, the estimates are not sensitive to factors listed in this question. There can be no doubt that leasing and other policies that give real incentives for active exploration and development work will increase the prospects of additional gas reserves being discovered and proven.

I.A.4. We have made no estimate of the potential gas reserves of the areas listed that could be considered to be reliable,

nor have we evaluated the effect these might have on transportation systems for Prudhoe Bay gas.

I.A.5. BP Alaska is not directly involved in any gas pipeline ventures and therefore is not best qualified to respond to this question. Any leasing and development policies that give incentives for active exploration and production should lead to a situation where more data will exist to evaluate the possible alternative transportation systems.

I.B.1. When a gas pipeline is constructed and available to transport gas from the Prudhoe Bay field, sometime after the commencement of oil production, the field should be able to produce sales volumes of about 2 to 2.5 billion cubic feet of gas per day. These rates should be sustained by the operation of the field under an overall reservoir management scheme with pressure maintenance by water injection being applied and continued as necessary.

I.B.2. Until further information is available from both reservoir data and production history, there will remain some uncertainty as to the reservoir management necessary to sustain the offtake rates quoted. However, BP Alaska considers that offtakes within the range given can be sustained with appropriate development drilling and facilities installation, and with pressure maintenance as necessary so that there will be no significant loss of ultimate oil recovery.

I.B.3. BP Alaska has not yet received the full Van Poolen report and therefore is unable to comment on the implications in that study. Experience from production history and tests will enable the operators in the field to more precisely design a management scheme that will enable the field to be efficiently produced to sustain the planned offtake rates. We do not consider that any trade off between gas and oil production is implied by recognizing that this additional data will enable the operators to refine or revise their development plans.

I.B.6. It is not currently possible to estimate reliably what the ultimate cost of the facilities to be installed for gas production will be, nor, without any experience, what the exact operating costs might be until gas production commences. Both the unique nature of the location and the current trend

J. Gore

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February 12, 1976

of escalating costs make any reliable estimations difficult. Further such direct costs should not be viewed in isolation from the overall costs of exploration for the discovery of this gas and the taxes that will be applied.

II.A.3. BP Alaska has entered into an agreement with Northern Natural Gas Company, which gives them the option to purchase the as yet undefined volumes of gas that may be attributed to BP Alaska through the BP Alaska/Sohio net profits interest agreements, up to a maximum volume of 3 trillion cubic feet. BP Alaska has not entered into any agreement which concerns the basis or method of transport of the gas which Northern Natural has the option to purchase, or any other gas that may be available to our company on the North Slope.

BP Alaska also has made similar commitment to Columbia Gas Transmission Corporation with respect to any Prudhoe Bay gas not required to satisfy its undertaking with Northern Natural Gas.

II.B.2. (a) As indicated previously, BP Alaska has granted to Northern Natural Gas an option to purchase up to 3 trillion cubic feet of gas attributed to its net profits interest in Prudhoe Bay leases, held by Sohio, and some of BP Alaska's other leases on Alaska's North Slope. The amount of Prudhoe Bay gas owned by BP Alaska is related by contract to the time and volume of sustained oil production from Prudhoe Bay, and also is related to the level of oil produced at specific times. The total amount of Prudhoe production also is dependent upon unitization and production methods, all of which makes it impracticable, if not impossible, for Northern to exercise its option until the Prudhoe field goes on production.

(b), (c) & (d) Northern's option provides for good faith negotiations of the price and other terms at the time gas is available for purchase.

BP Alaska also has made similar commitment to Columbia Gas Transmission Corporation with respect to any Prudhoe Bay gas not required to satisfy its undertaking with Northern Natural Gas.

PRUDHOE BAY FIELDSADLEROCHIT SAND RESERVOIR OIL DATA

---JOHN HUBER

ANALYSIS OF STOCK TANK OIL SAMPLES

H ₂ S-% wt.	NIL
SULPHUR % WT	0.95
POUR POINT	27.5°F.
KINEMATIC VISCOSITY (CENTISTOKES)	
	50°F. 53
	70°F. 26
	100°F. 12.6
GRAVITY API	27.9
VANADIUM ppm	13.5
NICKEL ppm	7
WAX % WT	6.3
MELT PT WAX°F	135
% DISTILLED 150°C.	9.5
" 200°C.	17.5
" 300°C.	38.0

SEPARATOR GAS DATA

	<u>PRESSURE</u> <u>(psia)</u>	<u>TEMP.</u>	<u>GOR.</u>	<u>GAS SP. GR.</u>	<u>S.T.O. GRAVITY</u>
1st	615	130	620	0.785	
2nd	100	120	130	0.950	
3rd	15	115	<u>37.7</u>	1.33	0.8864
			787.7		(28.13°API)

SEPARATOR GAS MOL %

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
CO ₂	15.27	18.75	12.91
N ₂	0.75	0.23	0.03
C ₁	73.94	55.66	24.03
C ₂ - C ₉	10.04	25.36	63.03

NOTE HIGH CO₂ CONTENTRESERVOIR TEMPERATURE - 200°F.

REPORT ON METHANOL/METHYL FUEL

Prepared for: Senator John Huber

By: Franklin D. Fleeks

Introduction

Along with the discovery of the Prudhoe Bay oil field came the discovery of a vast pool of gas located at the same field. In order to exploit and remove this resource various schemes have been brought forth. The focus has been on removal by a gas pipeline. The Legislature formed the Joint Gas Pipeline Impact Committee to make a thorough study to help formulate and implement necessary policy decisions.

While gathering its data, questions have arisen dealing with (1) competing gas line proposals, (2) how to handle the state's royalty gas, and (3) problems with federal regulatory agencies. In a thought-provoking report, the consultant to the Committee -- Rush Moody, Jr., succinctly outlined the federal problem. If natural gas is sold in interstate commerce, regulation will be done by the Federal Power Commission. Whether or not the state's royalty gas is initially taken "in kind" it is more than probable that when a later request is made, the state could not withdraw its royalty share without FPC approval.¹

Considering the current regulated price of gas and the degree of possible federal interference with Alaska's policy regarding its natural gas resource, several alternatives have been looked at. Senator Huber, a member of the Joint Committee, has pursued an alternative based on conversion of the gas to methanol/methyl fuel.

We use methanol here for convenience. The proper term should be methyl fuel, a liquid consisting principally of methanol, produced catalytically from synthesis gas, a mixture of hydrogen and carbon monoxide.

What is Methanol/Methyl Fuel and Its Uses

Methanol/Methyl Fuel or methyl alcohol, CH_3OH , is a colorless, neutral liquid at ambient temperature with a mild odor.² In its earliest form, it was called "wood alcohol." It is a clean burning stable fuel which can be converted from natural gas and coal. It can be shipped in conventional tankers and stored in conventional tanks.

The versatility of methanol is clearly shown in the use that can be made of it. Some of its more important uses currently and in the future are:

- (1) Directly as a liquid boiler fuel;
- (2) Turbine fuel;
- (3) In automotive fleets;
- (4) Petrochemical feedstock;
- (5) Development of Alaskan coal resources.^{3,4}

Chemical Feedstock

As Exhibit 1 shows, methanol/methyl fuel can be converted into a number of chemicals having commercial value. The methanol/methyl fuel produced from Alaskan gas and coal resources can create an array of downstream petrochemical industries. With the decrease of hydrocarbon feedstocks based on natural gas in the lower 48 there is a market for methanol/methyl fuel produced from Alaskan coal and gas.

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Gasoline Additives

Methanol/methyl fuel can be used as a gasoline additive or as a substitute for gasoline.

As an additive, methanol/methyl fuel will decrease current gasoline consumption on a barrel for barrel basis. According to available information, there is no fall off in fuel efficiency up to approximately ten percent blend levels.⁵ Methanol/methyl fuel, however, has about half the heating value per gallon when compared to gasoline. Comparison of some of the properties of methanol/methyl fuel and gasoline are shown in Exhibit 2.⁶ A bill, introduced in the California Legislature in 1975, would require the addition of methanol to gasoline sold in the state.

Methanol/methyl fuel can effectively reduce the level of pollutants caused by automotive emissions.⁷ From a study carried out by the Lawrence Livermore Laboratory in 1974 the following is given:

"... The health effects on man as a consequence of emissions from methanol as compared to gasoline fired automobiles can be summarized as follows: (1) reduction in adverse health effects of photochemical smog as a consequence of reduced photoactivity, (2) elimination of the possibility of lead toxicity to children and other sensitive individuals, because no lead is needed to boost the octane number (3) aromatic emissions from automobiles will be drastically reduced, reducing the carcinogens released to the atmosphere, and (4) reduce exposure to sulfuric acid mist. . ." 8

One of the crucial elements in the gas pipeline/methanol energy debate is what is the net effective energy. If methanol is added in at ten percent blend it will increase the efficiency of energy used in the automobile.

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" . . . (The) maximum BTU's available from the estimated Prudhoe Bay maximum gas production is 2.36 trillion BTU/degrees. That same gas, transformed into methanol at the wellhead would yield at least 514,000 bbl of methanol. Transported to the lower 48 states at no BTU shrinkage . . . it would displace 514,000 bbl of gasoline in a ten percent blend. Gasoline has a BTU content of 514 million BTU per bbl so the net gain in effective energy in the transportation part of the lower 48 market would be 2.7 trillion BTU/day. This is more than the natural gas delivered BTU's of heating value. . . ." 9

Industrial or Electrical Utility Fuel

The use of methanol/methyl fuel as a liquid boiler and liquid turbine fuel is currently feasible. Tests have been carried out by the electrical utility industry which show that turbines perform more efficiently on methanol/methyl fuel. Although twice as many gallons of methanol/methyl fuel must be burned to provide the same number of BTU's as oil, turbines burning methanol/methyl fuel generate up to six percent more power per million BTU's.¹⁰

Transportation of Methanol/Methyl Fuel

The transmission of methanol/methyl fuel to a shipping point for transport to potential markets can be done in a variety of ways. After conversion at Prudhoe Bay, it can be shipped on a batch basis through the Alyeska pipeline, a common carrier.¹¹ The enabling legislation for the Alyeska Pipeline project (PL 93-153) allows for transportation of synthetic or gaseous fuels through the Alyeska Pipeline.¹² Also a pipeline could be built entirely for methanol/methyl fuel and other synthetic or gaseous fuels.

Once the methanol/methyl fuel reaches tidewater it can be shipped in conventional tankers. Unlike liquified natural gas (LNG) methanol/methyl

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fuel does not need special tanker ships to carry it or special storage facilities. Present proposals call for the transportation of natural gas by pipeline to Gravina Point where it will be liquified for shipment via tankers (to be built) to it demand markets.¹³ Use of conventional tankers in transporting methanol/methyl fuel can cut into the lead time needed to get the product from the gas field to market.

Methanol/Methyl Fuel Concept Effect on Alaska

One immediate effect would be to remove the gas from FPC jurisdiction. In Mr. Moody's letter of January 14, 1976, he concluded:

"... if North Slope gas is converted to methanol before becoming committed to interstate commerce, the conversion facilities, the methanol itself, and the transportation of methanol would not be subject to FPC control. Since the natural gas would be produced and "consumed" (i.e., converted to something other than natural gas) within the state, the natural gas would never become subject to FPC jurisdiction. . ." 14

For Alaska, one of the most promising concepts that methanol/methyl fuel opens up is the possibility of using the state's coal resources. By taking the state's royalty gas in kind and transporting the gas to the vicinity of the major Alaskan coal fields, especially those near tidewater, a new industry can be developed.

The coal and gas mixture increases the conversion to methanol/methyl fuel by approximately ten percent. The building of the methanol/methyl fuel plants will provide an infrastructure that will be in place once the natural gas resource is depleted. That infrastructure will be available to further develop the state's coal resources. The building

of the methanol/methyl fuel plants will provide needed energy for the state, increase employment, and provide the industrial infrastructure needed to develop one of the state's most abundant resources, coal.

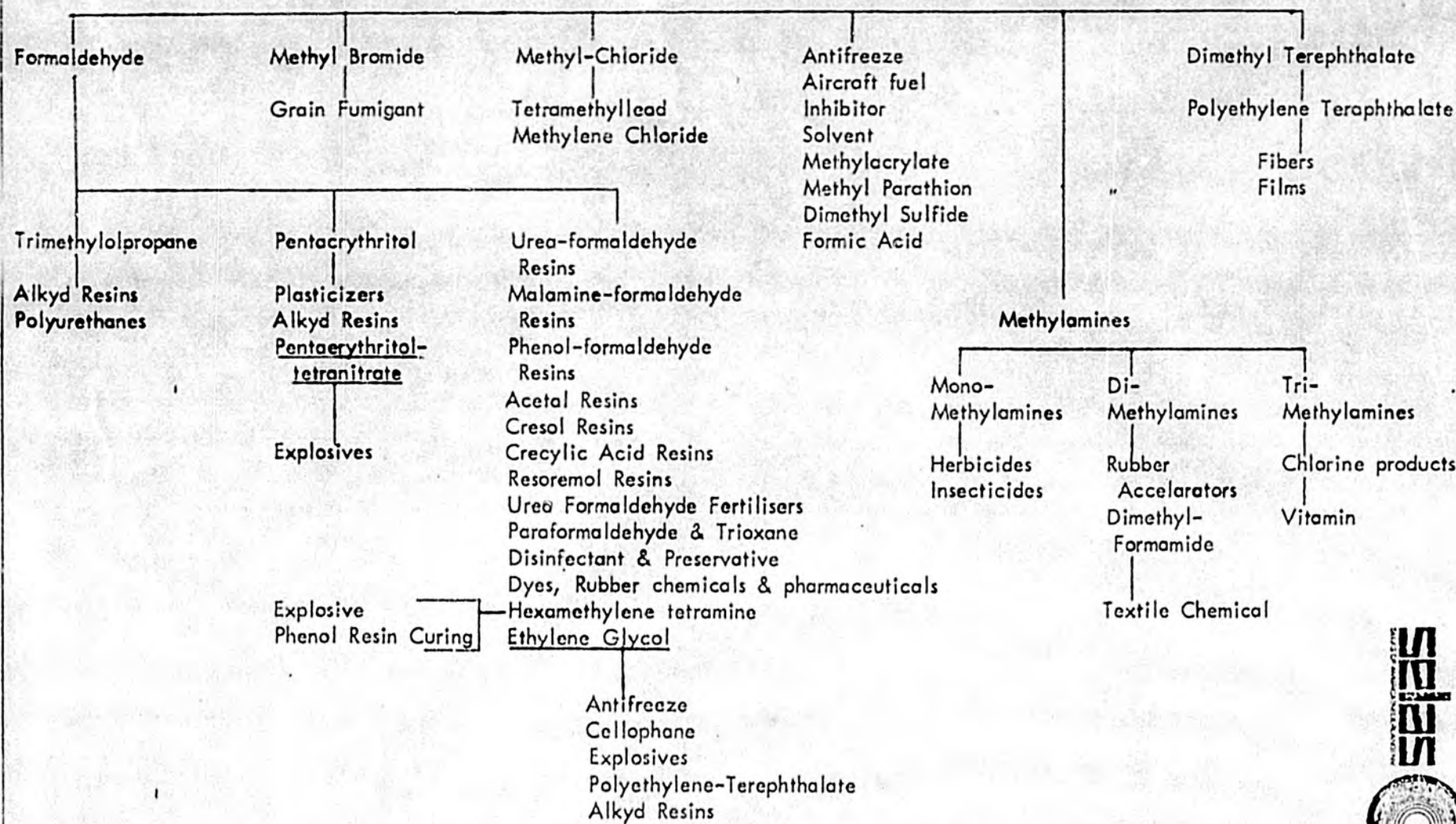
Conclusion

From review of the literature and studies, most of the data presented is in a prospective form. Even though prospective, the production of methanol/methyl fuel using Alaskan gas is feasible and should be pursued as a viable alternative. The methanol/methyl fuel concept will negate federal regulation, provide a substitute to help alleviate the nation's energy problems and protect the environment by reducing pollutants. The market for industrial chemical uses is not yet defined. However, the net quantities of methanol/methyl fuel produced from Alaskan natural gas can be absorbed by the electrical utility and automotive markets. Continued study should be made of the methanol/methyl fuel concepts.

FOOTNOTES

1. Rush Moody, Jr., Legal Analysis of Issues Relating to Natural Gas Transportation, 64 (1976).
2. Lecture, Methanol -- Feedstock for the Chemical Industry and Fuel of the Future, Tiemann and Raghuraman, Solas of American, April, 1973.
3. Alaskan Methanol Concept -- A Pre-Feasibility Study, Institute for Energy Analysis, Oak Ridge Associated Universities, IEA Research Memorandum, 75-5, Nov., 1975.
4. The Clean Synthetic Fuel That's Already Here, E. Faltermeyer, Fortune Magazine, Sept., 1975, 147.
5. Alaskan Methanol Concept, supra.
6. Methanol -- The "New Fuel" from Coal, Mills and Harney, Chemtech, January, 1974, 26.
7. Arctic Energy A New Perpesctive, Westinghouse Oceanic Division, January, 1976, 42.
8. Paper, Environmental Aspects of Methanol as Vehicular Fuel: Health and Environmental Effects, Beverly J. Berger, Lawrence Livermore Laboratory, Sept., 1974, 4-5.
9. Arctic Energy, A New Perspective, supra, 50.
10. Faltermeyer, supra, 150.
11. Alaska Methanol Concept, supra, 66.
12. Arctic Energy, A New Perspective, supra, 10.
13. Trans-Alaska Gas Pipeline Project, State of Alaska, Department of Labor, December, 1975, 2.
14. Moody, Jr., Cover letter, supra, 8.

METHANOL



SELAS OF AMERICA (NEDERLAND) N.V.



EXHIBIT 2

COMPARISON OF METHANOL AND GASOLINE

	<u>Methanol</u>	<u>Gasoline</u>
Formula	CH_3OH	$\text{C}_4\text{H}_{10}\text{C}_{12}\text{H}_{26}$
Boiling point, F	148	100-400
Freezing point, F	-144	-100
Latent heat of vaporization at bp BTU/lb	502	116
Liquid density 16/gal.	6.6	6.2
Heat of combustion (liquid-fuel-liquid H_2O) BTU/lb.	9,776	20,260
BTU/gal.	64,500	124,800

Source: Mills and Harney, Methanol -- The "New" Fuel from Coal;
Chemtech, January 1974, 27.

TANZER ECONOMIC ASSOCIATES, INC.

ECONOMIC CONSULTANTS

302 WEST 86TH STREET

NEW YORK, N. Y. 10024

(212) 421-1950

CABLE "TANZECON" NEW YORK

February 13, 1976

Senator John Huber
Chairman,
Special Committee on Taxation and Revenue
Alaska State Legislature
Pouch V
Juneau, Alaska 99811

Dear John:

Thank you for sending me a copy of the Rush Moody report on "Legal Analysis of Issues Relating to Natural Gas Transportation." I did indeed find it quite interesting and informative. While I am not competent to comment on the legal issues analyzed, I am happy to respond to your request for comments or recommendations on the report, as it may touch on economic questions. This letter represents my initial reaction to some of these matters:

1. As I understand the Moody report, a key legal conclusion is that the State should take royalty gas in kind rather than in value; otherwise, it may lose control in the future of this royalty gas because it will come under FPC regulation, and thus it would be possible that none of Alaska's natural gas would be available for consumption within the State.

2. From an economic point of view, I think the State would also be wise to take royalty gas (and maybe royalty oil also) in kind, so as not to lose the future option on having the royalty gas. This is particularly true because the real value of the royalty gas to the State may be much higher than its market value, for the following reasons.

3. First, at present the price of FPC regulated natural gas moving in interstate commerce is about one-fourth its real market value, as measured by prices on intra-state sales (50¢ versus \$2.00 per MCF). While natural gas prices may be deregulated in a few years, there is no present certainty on this.

4. More important, in the long run I think it is generally agreed that the use of natural gas for its heat content as a fuel is a waste of a valuable resource, since its greatest value would be as a petrochemical feedstock. This suggests among other

things that over the long run natural gas prices will rise as it increasingly is reserved for its more valuable use.

5. But, because of the high profit rates the oil companies use in their DCF calculations (as discussed at length in my report), their decisions will tend to be made on short run profit considerations, which may not be best for the State. By way of hypothetical illustration, I constructed a case to show where it might be better for the State to have the gas stay in the ground until it became more valuable, while for the companies it would be more profitable to produce quickly. The hypothetical assumptions were that natural gas would sell at \$2 per MCF in the 1980s, \$6 per MCF in the 1990s, and \$18 per MCF thereafter. Assuming a time value of money, or discount rate, for the companies of 20% per year and for the State of 10% per year, it turns out that if a gas field has a 20 year life, the companies would be best off producing all the gas in the 1981-2000 period, while the State would be better off with the gas produced in the 1991-2010 period. (See attached table.)

6. The problem of the State having a lower discount factor, and hence a longer time horizon, than the companies is of course a general one which may lead to conflicts of interest in many oil and gas areas. Thus, for example, it may be better for the State if all oil and gas were produced at a slower rate than the companies would like, and it is possible that this could be handled under conservation regulations. Specifically, however, with regard to its royalty gas, if the State decides it would be better off with gas production at a slower rate than the companies want, perhaps a way could be worked out to require the companies to leave the royalty gas in the ground until the State requests it, either for its own use or for resale. Alternatively, the State could perhaps exchange the royalty gas with companies for "future gas" to be delivered by them when desired by the State.

7. Another factor favoring taking of royalty gas in kind is that market prices of gas may not reflect the full economic cost to the State of not having the gas. In the short run, a lack of gas could mean costly shutdowns of industry and great consumer inconvenience. In the long run, the absence of an assured supply of gas might hinder the whole economic development of the State. Thus, the question of royalty gas cannot be divorced from questions of planning long-run economic development. But, at least keeping the option to take gas in kind does not foreclose future industrial development opportunities.

8. Also, I think taking royalty gas in kind would have the advantage that it will help the State learn more about the oil and gas business, from practical experience. With oil companies fully integrated from the raw material through petrochemicals, and with the allocation of costs between oil and gas production,

and between raw material production and other functions, often being arbitrary, it is important for the State to have a good grasp of the practical economics of the gas business as well as the oil business. This is vital for the State even if it is to simply maximize its benefits as a tax collector.

9. Finally, I certainly agree with the Moody Report's general recommendations that State leasing policies and taxation on natural gas should be reconsidered. In my opinion both of these questions call for detailed study of possible alternatives. Here I would only observe that tax rates in Texas and Louisiana, where the oil companies have widespread political support from small producers, would not normally be an adequate yardstick as to what rates of taxation could be imposed.

I hope these general comments will be of use to you. My thanks also for your kind words about my report.

Yours sincerely,

Michael Tanzer

Dr. Michael Tanzer,
President

ALASKAN NATURAL GAS PRODUCTION:
HYPOTHETICAL EXAMPLE ILLUSTRATING
POSSIBLE CONFLICT OF INTEREST
BETWEEN THE STATE AND THE COMPANIES
OVER TIMING OF PRODUCTION

Assumptions:

- (1) Prices of natural gas (\$ per MCF): 1981-90, \$2; 1991-2000, \$6; 2001-2020, \$18.
- (2) Ignore in all cases investment and operating costs (Alternative interpretation: Prices are net of costs).
- (3) Potential production = 1 MCF per year for 20 years.
- (4) Discount factors for computing present value in 1980 of future income from gas: companies, 20% per year; State, 10% per year.

**TOTAL VALUE OF INCOME FROM
20 YEARS OF GAS PRODUCTION (\$):**

	1981-2000	1991-2010	2001-2020
A. Gross Value (undiscounted)			
(a) First 10 years	20	60	180
(b) Next 10 years	60	180	180
(c) Total 20 years	80	240	360
B. 1980 Present Value, Discounted at 20% per year (company rate)			
(a) First 10 years	8.39	4.06	1.96
(b) Next 10 years	4.06	1.96	.32
(c) Total 20 years	12.45**	6.02	2.28
C. 1980 Present Value, Discounted at 10% per year (State rate)			
(a) First 10 years	12.29	14.22	16.43
(b) Next 10 years	14.22	16.43	6.32
(c) Total 20 years	27.51	30.65**	22.75

** = Most profitable production period

METHYL-FUEL

Wentworth Brothers, Inc.

Cincinnati, Ohio

At the onset, I would like to very briefly outline the METHYL-FUEL concept.

At the present time, the total installed world's methanol production (chemical grade) is about 25,000 short tons, (a short ton contains about 7.2 API barrels, or just over 300 gallons). This capacity consists of about 5,000 tons in Japan with the balance about equally split between the U.S. and the balance of the world.

In the U.S., our personnel have designed about 30-35% of the installed capacity, including the current worlds largest chemical grade plant (2,500 TPD) down in Beaumont, Texas.

In part stemming from the later plant, and recognizing the large volumes of associated gas being flared in remote locations, the METHYL-FUEL concept was brought forth as a means to bring this energy to market in a stable liquid form. Events in 1973, the Middle East war, temporarily brought a halt to this endeavor in many parts of the world.

This then prompted a renewed look at producing METHYL-FUEL from our nations coal reserves.

When considering coal as feedstock, one is forced to consider the environmental unacceptable coals, the low quality coals or the marginal coals in remote locations. Good, high quality coal should be used as is.

A brief while back, it was brought to our attention that significant quantities of coal existed in Alaska. Very preliminary studies indicated that these coals can be quite economically converted to METHYL-FUEL and transported as a liquid to distant markets. Through this work, the melding of possibilities came forth wherein the production of METHYL-FUEL from the State's coal and/or from the State's coal and gas, appears to offer a very attractive situation. Examples:

1. The synthesis gas from coal for METHYL-FUEL production is deficient in hydrogen. Synthesis gas from natural gas is deficient in carbon. This brings forth the prospect of a optimized combination coal and gas fed plant with thus a considerable increase in conversion efficiency.

2. Many of the Alaskan coals appear to be the type that would lend themselves to simple coal beneficiation. This brought forth the concept wherein, for example, two tons of coal would be mined, one ton would be upgraded to a dehydrated, low sulfur, high BTU coal, the other ton (or the reject from the beneficiation) would serve as METHYL-FUEL feedstock. The METHYL-FUEL would then be utilized as the slurring media for the beneficiated coal. This not only results in further increases in conversion efficiency, but permits very economical transport of the beneficiated coal and a most appropriate use of gas and coal in the State.

3. It is understood that the gas with Alaskan crude contains a rather large amount of carbon dioxide (CO_2). For METHYL-FUEL production, this presence of CO_2 is a benefit in that it does not have to be removed to permit METHYL-FUEL production, but rather augments it and becomes of the product -- METHYL-FUEL.

4. It is understood that the Alaskan associated gas contains a fair amount of LPG (Propane and Butane) and natural gas liquids (iso pentane and heavier). Our firm has a proprietary process wherein the butane and heavier liquids can be handled very economically with METHYL-FUEL with no loss in conversion efficiency for these stocks. This concept can thus result in the elimination of the waste in at least one, perhaps two, or even three of the other energy systems that will result. The capital and operating cost