

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 8672

657 SCOMM21: ROYALTY OIL & GAS FILES 1977-78

Schedule I of Appendix B, offshore advances accounted for most of the money advanced to producers under the program. More specifically, Schedules I(c) and I(d) of Appendix C show that for Order Nos. 465 and 499, respectively, approximately 90% of the money advanced under those orders was advanced to offshore producers in the Texas Gulf Coast and Southern Louisiana area. 7/

At the oral argument held on October 23, 1975, as well as in the responses filed, several pipelines 8/ argued that offshore advances cannot be shown to have had a quantifiable accelerating effect and that the net result of offshore advances is to determine that one pipeline receives the gas rather than another. Moreover, the pipelines cited the financial burdens heaped upon pipelines resulting from offshore and onshore advances and recommended that the program be discontinued and that Order 499 be allowed to expire by its own terms such that advances made pursuant to contracts entered into after December 31, 1975, would not receive rate base treatment. As aforesaid, some pipelines and producers generally supported offshore advances and stated that they were generally beneficial.

The Public Service Commission of the State of New York (New York) restated its contention that offshore advances have not had an "accelerating" effect and that such advances are mere "commitment fees" enabling one interstate pipeline to get gas from a given prospect, rather than another interstate pipeline. New York also argued that the Commission did not consider the effects of advance payment program in setting the area and national producer rate levels for either offshore or onshore producers.

Our review of the responses from interested parties, as well as the entire record of the investigation, shows that some advances have aided the development of offshore natural gas reserves. However, we cannot find, based on this record, that there was sufficient quantifiable acceleration or initiation of exploration, development and production of offshore reserves to meet the test laid down by the Court of Appeals for these proceedings.

7/ The money advanced in Categories (3) and (4) on those schedules is almost all for offshore prospects.

8/ Transwestern, Texas Eastern, Transco, United, Tennessee, Southern Natural, Florida Gas, Mid Louisiana, and Texas Gas.

We note that this finding is made more difficult by the recently speculative nature of the test we are asked to apply. A myriad factors which influence managerial decisions with respect to procuring gas for the interstate market include international and monetary policy, general business and economic conditions, and the regulatory climate, as well as the managers' opinions about each of these. In making judgments about the wisdom of decisions based on these factors we are forced to rely heavily on the self-serving predictions of interested parties and to speculate ex post facto about events which did not occur. Just as one can speculate about the results for the national economy if wage and price controls had not begun in 1971, we may speculate about the results in the absence of an advance payments program. In either case, however, no more than an informed speculation is possible.

Furthermore, we are not able to find from our consideration herein that the advance payment program offshore has had a significant substantial impact on development of natural gas reserves that was expected of the program at its inception. Accordingly, as a matter of public policy, we shall allow the unexpired portion of the advance payment program to expire as of the time and date of issuance of this order. Our treatment of the executory portion of offshore advance payment contracts subject to Order Nos. 465 and 499, as well as the propriety of the orders, will be discussed later in this order.

2. Onshore Advances

Schedule II of Appendix B indicates that within the lower 48 states, there was evidence to indicate that advance payments were under all orders (410, 441, 465 and 499) had a beneficial effect. For 58% of the onshore advances (\$158 million), which was associated 2.4 trillion cubic feet (Tcf) of proved reserves, 9/ it was indicated by the producers that they had invested amounts of capital from other sources, and that the advance was a critical and necessary factor in securing the production of these reserves for the interstate market. Other producer responses indicate that onshore advances secured gas for the interstate market by offsetting such factors as low interstate producer prices, marginal well production, competitive gas from the intrastate market and the high risks associated with the development of certain properties.

These percentages are of the total producer responses received. Producer responses onshore were received for approximately 90% of the proved reserves indicated in the Summary Report (Appendix C).

At the oral argument, these contentions were restated by a representative for a group of small producers 10/ as well as some of the pipeline participants. New York stated that, in all probability, favorable evidence would be found to support onshore advances. However, New York recommended alternatives to such advances such as interest-bearing pipeline loans to small onshore producers or arrangements onshore wherein the pipeline would receive a working interest. The pipelines opposing continuation of the advance payment program 11/ also stated that onshore advances were beneficial, but recommended that instead of extending the advance payment program, the Commission could best assure development of onshore gas and its dedication to the interstate market through raising the flowing gas rate in Docket No. R-478, and through the use of producer special relief procedures on marginal properties.

Our review of the evidence submitted and compiled in this investigation indicates that there is more record support for onshore advances, than for offshore advances.

As indicated above, there is evidence that much of the new proved reserves associated with onshore advance payments would not have been developed and dedicated to the interstate market but for the advances. As discussed in connection with offshore advances, however, this judgment, too, is based on retrospective predictions about a state of events which did not occur. We do find that to the extent the Court of Appeals' test can rationally be applied, the onshore advances meet this test.

We believe, as a matter of public policy, it is time to end the advance payment program onshore, as well as offshore, and to use other means to increase the necessary cash flow to onshore producers. We note that on August 28, 1975, we issued Opinion 742, 12/ which permits small producers, most of whom operate onshore, to collect a just and reasonable rate equal to 130% of the applicable area or national rate for large producers. Moreover, in Docket No. R-478, we have today issued Opinion No. 748 which increases the rate for flowing gas for producers and we have before us a proposal in Docket No. RM75-14 to review new gas rates for producers. Those proceedings are the appropriate place to consider recognized need for increased cash flow for the exploration, development and production of onshore, as well as offshore reserves, for the interstate market. Moreover, where appropriate, as in the case of marginal properties, we

10/ See Transcript of Oral Argument, Volume 1 (Tr. 195-205) in Docket Nos. R-411 and RM74-4.

11/ See Footnote 8 above.

12/ _____ FPC _____ in Docket No. R-393.

page parties to file under our special relief procedures. Increased cash flow is necessary if we are ever to get more to the interstate market. We shall discuss the treatment of the executory portion of onshore advance payment contracts to Orders 465 and 499, as well as the refund issue as it relates to onshore advances, later in this order.

Alaskan Advances

As of April 1, 1975, the cut-off date for responses for the Primary Report in Appendix C, there were no Alaskan advances made under Order 499. Order 499 was the first and advance payment rulemaking order specifically permitting the same treatment for advances in Alaska. However, we find it necessary and appropriate to evaluate the entire onshore advance payment program in order to determine the disposition of both pre-Order 499 Alaskan advances and advances made under contracts executed on or after October 28, 1973, the effective date of Order 499. Schedule I of Appendix B indicates that approximately 64% of the proved reserves associated with advances would have been dedicated to the interstate market absent advance payments, according to producer responses. The producers also state, however, that substantial acceleration occurred as a result of the advances. Schedule II of Appendix B indicates that advances from producers who control 35% of the proved reserves indicate that sufficient capital was not available absent an advance payment program.

At oral argument, several parties stated specific support for the Alaskan advance payment program including the Gas Pipe Line Company, Northern Natural, Panhandle & Eastern, ARCO, Exxon and Southern California Gas Company, and the higher costs of exploration and development and the acceleration effect these advances are having.

However, Alaskan advances were strongly opposed by the Arizona Group (The Arizona Commission, Tucson Gas & Electric and Arizona Public Service Company) since, it was alleged, major pipelines are tying up all of the producer reserves in Alaska and prejudging the Section 7 proceedings which will take place before this Commission regarding certification of production and transportation of Alaskan gas to the lower 48 states. The Arizona Group noted that Order 529 13/ required pipelines to make advances in Alaska, as well as in the lower 48 states, to relieve long-term commitments of the gas associated with

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Issued June 17, 1975, in Docket No. RM75-6; rehearing denied, Order No. 529-A, issued August 15, 1975.

the advance. Thus, areas not served by pipelines making Alaskan advances, such as Arizona, would be precluded from getting any Alaskan gas.

Therefore, the Arizona Group urges that the Alaskan advance payment program be terminated forthwith; that commitments under existing contracts to make future Alaskan advances not be honored; and that the Commission clearly indicate in a policy statement that Alaskan advances or interest payments, such as those approved in California for intrastate distribution companies, will not prejudice the Section 7 certificate proceedings involving Alaskan gas.

Alaskan advances were also strongly opposed by representatives from various California groups including a California consumer group named TURN (Toward Utility Rate Normalization) represented by Sylvia Siegel; the Cities of San Diego, Los Angeles, Santa Barbara, San Francisco; as well as the California Public Utilities Commission. Basically, these parties argued that the FPC's Alaskan advance payment program was being used by producers in Alaska, such as Exxon and ARCO, to "blackmail" the California Commission as well as California consumers, by allegedly "forcing" the California Commission into approving interest payment arrangements between intrastate California distributors and Alaskan producers on the threat that if such arrangements were not approved by the California Commission by a date certain, the producer would terminate the arrangement and seek an advance payment under Order No. 499 from an interstate pipeline from another area of the country and thus commit the Alaskan gas to that interstate pipeline. ^{14/} Thus, all parties from California (with the exception of Southern California Gas Company) recommended rapid termination of this Commission's advance payment program insofar as Alaskan advances are concerned.

Under Order No. 499, only four contracts have been entered into by pipelines and producers for Alaskan gas; Panhandle and ARCO dated May 30, 1975; Texas Eastern and ARCO dated June 30, 1975; Northern Natural and Exxon dated September 29, 1975; and Michigan-Wisconsin and Exxon dated October 24, 1975. Although amounts have been advanced under

^{14/} It should be noted that in statements filed with the F.P.C. after oral argument, ARCO and Exxon replied to the "blackmail" allegations of the California Commission stating, inter alia, that the interest payment arrangements approved by the California Commission were made pursuant to valid California Commission regulations.

four contracts, to date only Panhandle has received rate treatment for a portion of such advances (\$16.4 million of \$46.4 million advanced). 15/

We note that Alaskan advances are similar to offshore ones in that, as of now, there is no intrastate market to compete with the interstate market and no prospect of a market developing in Alaska in the near future. We are not convinced, based upon our findings herein, that all Alaskan gas will eventually go interstate. We are not convinced, based upon our findings herein, that offshore advances in the lower 48 states, that any appreciable and quantifiable acceleration of development and production of Alaskan gas will occur sufficient to meet the Court's test. As to the need for capital, we note that both ARCO and Exxon, recipients of Alaskan advances made under 499, have already demonstrated their ability to raise capital on their own by the fact that Exxon, in the case of this Commission, and ARCO, in the case of the California Commission, have entered into agreements with interstate pipelines and intrastate distributors, respectively, whereby they would not receive advance payments, but would raise the capital on their own, charge the respective interstate pipelines and intrastate distributors the interest on such capital in return for gas to be delivered at a future date. As this Commission recently found in those orders which disallowed rate treatment of pipeline rate cases for the interest payment arrangements, 16/ such arrangements demonstrate a prima facie case for the proposition that the producer is able to generate sufficient capital on his own so as to obviate the need for advance payment in any form. Furthermore, we agree with those parties in their comments, and at oral argument, opposed this Commission's Alaskan advance payment program as being contrary to the national interest in permitting a few pipelines, among others, to tie up almost all of the Alaskan natural gas production, to the exclusion of others, through advance payments which provide little or no benefit to the ultimate consumer.

After weighing all the factors, the Commission has determined that it is in the public interest to terminate rate base treatment of Alaskan advances made under 499 on December 31, 1975, for Alaskan advances made under

Texas Eastern/ARCO: \$16.4 million advanced
 Northern/Exxon : \$58 million advanced
 Mich-Wis/Exxon : \$58 million advanced

Northern Natural Gas Company, ___ FPC ___ issued July 11, 1975, in Docket Nos. RP75-87 and RP75-89; Michigan Wisconsin Pipe Line Company, ___ FPC ___ issued May 19, 1975, in Docket No. RP75-96.

contracts executed after December 28, 1973, the effective date of Order 499. Accordingly, any pipeline presently reflecting such advances in its rate base shall be required to file, within 60 days of the issuance of this order, revised rates to reflect elimination of such advances. Moreover, we note that all four of the Alaskan advance payments contracts which are subject to Order 499 contain "escape clauses" which provide, in essence, that should the pipeline not receive rate base treatment for the advances, all monies advanced plus interest will be refunded to the pipeline making the advance and the contract will be terminated. After consideration of the problems presented by the Alaskan advances, and after weighing all the equities related thereto, we find it in the public interest to require any pipeline making advances under the orders herein under consideration to refund all amounts collected as a result of including these advances in rate base.

We are also this day issuing, in Docket No. RP73-49, a proceeding requiring those parties to the pre-Order 499 Alaskan advance payment contracts to show cause why rate base treatment should not end for pre-Order 499 advances made in Alaska as of December 31, 1975, or such other date as the Commission might find appropriate.

It is appropriate at this time that we restate our policy enunciated in our September 16, 1975, Order in Docket Nos. R-411 and RM74-4, that state regulatory approval of arrangements, such as those interest payment transactions approved or being considered by the California Commission, does not and will not obligate this Commission to certify any proposed sales or transportation arrangements of Alaska gas under Section 7 of the Natural Gas Act to the advancing distributor.

REFUND ISSUE AS TO LOWER 48 STATES ADVANCES

As indicated above, we found that onshore advance payments did attract significant new or additional quantities of gas to the interstate market, and thus met our understanding of the court's test for this program, while offshore advance payments did not. However, in the exercise of this Commission's judgment as to proper policy in this field, and the costs and benefits involved, we have decided to terminate the program. The question thus arises as to whether or not refunds of carrying costs (return and associated taxes) charged to rate payers by pipelines making advance payments, should be made, as well as whether advances presently included in rate base should be permitted to remain in rate base. Although these issues were not addressed in the responses, several parties at the oral argument discussed them.

All of the major interstate pipelines, as well as all producers, opposed any refunds if the program is terminated. The Interstate Natural Gas Association (INGA) argued that if the program is terminated, no refunds should be allowed because it would be "illegal" for the Commission to do so, citing F.P.C. v. Hope Natural Gas Co., 320 U.S. 591 (1944), which, it is alleged, prohibits "retroactive ratemaking" and requires the Commission to protect consumer interests and pipeline economic health. However, INGA argued that refunds cannot be ordered because the Commission, in remanding the advance payment program to the Interstate Commerce Commission, permitted the program to remain in effect thus far. On equitable and financial grounds, INGA opposes any refunds if the program is terminated. All of the major interstate pipelines supported this position as did the Gas Distribution Companies, the producers participating in the program, and the Illinois Commission. Specifically, the Commission stated that a study was made, using the assumptions set forth in Orders 465 and 499 regarding the cost of advance payment to consumers. The results of that study, according to the Commission, show that refunds (based upon carrying charge factor of 10% and return and taxes of 13%) would be \$292,729,000 for all payments made under Orders 410, 441, 465 and 499, estimated as of December 31, 1975. 17/

The Louisiana Land & Exploration Company opposed refunds and argued that the decision whether or not to order refunds was based upon the equities, citing Consumer Federation v. F.P.C., which vacated this Commission's 180-day emergency sale program) as not a per se legal test, as was implied by INGA. The New York Commission agreed with Louisiana Land on this interpretation of the law, and, on an equitable basis, urged that the pipelines who have gotten no financial benefit from the program should not be required to make refunds. If anyone should make refunds, New York argued, it should be the producers. However, New York did not recommend that the producers make refunds either, but did suggest in passing that, in lieu of refunds, the Commission might want to consider making the producers "maybe spend some money onshore and devote it to the interstate market." (Tr. 322).

We agree with New York and Louisiana Land that the appropriate test for deciding whether or not to order refunds is balancing of the equities, rather than a per se legal test. 18/ However, based upon a review of the equities, we

Tr. 17.

Consumer Federation v. F.P.C.

do not find that refunds from either the pipelines or the producers would be in the public interest. First of all, as we noted above, there was evidence filed which shows that the program was in part a success, as for some of the offshore advances, as well as a higher proportion of the onshore advances. Moreover, ordering the pipelines to make refunds would impose a tremendous financial hardship on the pipelines because there is no guarantee whatsoever that the pipelines would be reimbursed by the producers for the carrying charges the pipelines would have to refund to their customers. Furthermore, we note that the U. S. Court of Appeals turned down the suggestion of the New York Commission that rate base treatment for advance payments be terminated and permitted the advance payment program to remain in effect pending the Commission's investigation of the program on remand. For all of the aforesaid reasons, we find that using the Consumers' test, the equities weigh against requiring refunds of carrying charges related to advances made under Orders 465 and 499.

As to advances made on or before December 31, 1975, under Orders 465 and 499, we find, based upon consideration of the equities relating to the refund issue, as well as the factors considered below in our treatment of post-December 31, 1975, advances in the lower 48 states, that rate base treatment for advances made on or before December 31, 1975, should be continued subject to the conditions of Orders 465 and 499, as appropriate.

TREATMENT OF POST-DECEMBER 31, 1975 ADVANCES

As to the issue of rate base treatment of post-December 31, 1975, advances made pursuant to lower 48 states advance payments contracts subject to Orders 465 and 499, INGA argued that the Commission should honor such commitments, and permit rate base treatment. Therefore, INGA argued that pipelines might not be able to break their contracts with producers and might thus be required to make advances to producers while reviewing no rate base treatment or other economic reimbursement from their customer. The New York Commission indicated that, in its opinion, rate base treatment for such advances should be allowed unless it could be shown that no disruption of the reserves dedication provisions of the advance payment contract should occur. The California Commission argued that rate base treatment for such advances should not be allowed since, if the program is found not to meet the Court's test in New York, it would be an empty act to permit rate base treatment for the executory portion of those contracts and thus allow a substantial portion of the advance payment program to continue.

The issue of rate base treatment for post-December 31, 1975, advances under contracts executed under Order 465 and

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be decided on the equities, like the issue of refunds. It is not in the public interest to place pipelines in possible financial jeopardy that might result from their having to renegotiate advance payments contracts made under Orders 465 and 499 containing provisions for making advances by December 31, 1975, in the lower 48 states. Our review of these contracts indicates that in the great majority of cases, the pipelines would be required to make advances whether or not this Commission allowed the pipelines rate base treatment for such advances. Furthermore, we note that the U.S. Court of Appeals, by its own motion, affirmed the program to remain in effect during this Commission's investigation of the program on remand. Accordingly, subject to certain conditions set forth below, we find it reasonable and appropriate to permit the advance payments program under Orders 465 and 499 in the lower 48 states to expire by its own terms and to permit rate base treatment for advances made after December 31, 1975, only with respect to contracts made under Orders 465 and 499 and subject to the conditions set forth below, as well as the conditions set forth in Orders 465 and 499.

In permitting rate base treatment for the executory portion of lower 48 states advance payments contracts subject to Orders 465 and 499, it is necessary that we attach certain conditions to rate base treatment for such advances to ensure that such contracts may not be used to perpetuate the advance payments program indefinitely. First, we note that some advance payments contracts permit the addition of new prospect contracts from time to time. In order to limit the scope of such contracts, it is necessary to provide that rate base treatment will not be authorized for advances on prospect contracts added to advance payments contracts under Orders 465 and 499 on or after the date of issuance of this order.

In addition, we shall deny rate base treatment for any advances made under the executory portion of existing contracts which are subject to Orders 465 and 499 when such advance is made after December 31, 1980.

As to the issue of the appropriate treatment of advances which result in the acquisition of a working interest by a pipeline or a pipeline affiliate, New York reiterated its strong opposition to such advances, unless the revenues from such working interest are credited to the pipeline's cost of service. Consistent with the action taken with respect to the advance payments program in general, it is appropriate that we not change rate base treatment for advances made under Orders 465 and 499 which result in the acquisition of a working interest by a pipeline or pipeline affiliate.

Our action with respect to Alaskan advances, coupled with our treatment of lower 48 states advances under Orders 465 and 499 and our intent not to issue a notice of rulemaking to extend the advance payments program to contracts executed after December 31, 1975, represents a reasonable and appropriate resolution of the issues raised in the Commission's investigation of the advance payment program in Docket Nos. R-411 and RM74-4.

The Commission further finds:

Good cause exists to terminate the investigation of the advance payment program under Orders 465 and 499, as hereinafter ordered and conditioned.

The Commission orders:

(A) The investigation of the Commission's advance payment program under Order 465 in Docket No. R-411 and Order 499 in Docket No. RM74-4, which investigation was instituted by our order issued herein on April 28, 1975, is terminated as provided below.

(B) Rate base treatment for Alaskan advances made under contracts executed on or after December 28, 1973, the effective date of Order No. 499, shall cease as of December 31, 1975, and any pipeline presently reflecting such advances in its rate base shall file, within 60 days of the issuance of this order, revised rates reflecting elimination of such advances. Any pipeline which has made Alaskan advances pursuant to Order No. 499 shall refund all amounts collected as a result of including these advances in rate base.

(C) Except as provided in Ordering Paragraph (B) above with respect to Alaskan advances, we shall permit the advance payments program to expire as of the time and date of issuance of this order, provided, however, that no rate base treatment will be accorded to advances under contracts subject to Orders 465 and 499 in the lower 48 states which advances are for prospects or tracks added to the advance payment contract on or after the date of issuance of this order; and provided further that rate base treatment shall be denied for advances made under contracts under Orders 465 and 499 where such advances are made after December 31, 1980.

(D) The Secretary shall cause prompt publication of this order in the Federal Register.

RESPONDENTS IN DOCKET NO. R-411 and RM74-4
Investigation of Advance Payment Program

Federal, Municipal Governments:

- of Los Angeles
- of San Diego
- of Santa Barbara
- Federal Energy Administration
- Civil Service Commission of the State of New York
- Public Utility Commission, State of California
- Representative Robert J. Lagomarsino
- Representative John E. Moss
- Representative Thomas M. Rees
- Senator Alan Cranston
- Senator Warren Magnuson
- Senator Lee Metcalf
- Senator John V. Tunney (2)

Other Representation:

Individual Letters of Protest filed

Contributors:

- Southern California Gas Company and Pacific Lighting Service Company
- Southern Indiana Gas & Electric Company
- Southern Kentucky Gas Company

Lines:

- El Paso Natural Gas Corporation
- El Paso Service Gas Company
- El Paso Gas Transmission Corporation
- Consolidated Gas Supply Corporation
- El Paso Producing Company
- El Paso Shore Natural Gas Company
- El Paso Natural Gas Company
- El Paso Nebraska Natural Gas Company
- El Paso Wisconsin Pipe Line Company
- Louisiana Gas Company
- Mississippi River Transmission Company
- El Paso Gas Pipeline Company of America
- El Paso Natural Gas Company
- El Paso West Pipeline Corporation

FEDERAL POWER COMMISSION

BUREAU OF NATURAL GAS

ANALYSIS OF PRODUCER RESPONSES TO
INVESTIGATION OF ADVANCE PAYMENT
PROGRAM

DOCKET NOS. R-411 AND RM74-4

WASHINGTON, D. C.

NOVEMBER 13, 1975

Company	1975	1976	1977
Sohio Petroleum Company	175,000,000	5,000,000,000	--
California Chevron	122,730,499	545,612,780	1,095,402,000
Burmah Oil Development	92,199,000	2,315,000	462,556,000
Mobil Oil Corporation	86,940,000	598,666,110	312,142,000
Mesa Petroleum Company	76,552,153	70,525,000	662,131,246
Tenneco *	59,000,000	326,510,010	41,424,668
Cities Service *	53,485,980	194,164,988	689,625,014
Shell	45,277,510	835,051,875	118,613,000
Pennzoil Offshore Gas Operators * <u>2/</u>	43,466,000	255,594,250	73,764,250
Getty	43,099,178	87,305,374	607,791,975
Skelly	40,486,602	198,935,911	457,260,028
La. Land & Offshore Expl.	37,800,000	69,448,000	16,666,000
Tenneco Oil & Minerals Ltd.	37,500,000	3,300,000,000	1,470,000,000
Exxon	37,018,109	231,600,000	2,500,800
Flacid	35,914,425	259,088,041	303,793,614

1/ Includes Alaska and Canada.

2/ Pipeline-affiliated at date of agreements.

* Denotes pipeline-affiliated producer.

Schedule 1

1975 SUMMARY OF ADVANCE PAYMENT STATUS SURVEY
ALL AGREEMENTS REPORTED

	Amounts Committed (\$)	Preliminary Exploration (\$)	Lease Acquisition (\$)	Actual Amounts Advanced		Proved Reserves (\$)	Other (\$)	Total Advanced (\$)	Status of Recoupment	
				Exploration Defining (\$)	Development Defining (\$)				Amount Recovered (\$)	Unrecouped Non-recoverable (\$)
Agreements Dated Prior to November 10, 1971 (Schedule I(a))										
"Lower 48" States	530,430,395	3,317,975	82,701,753	291,052,917	132,630,620	33,342,548	6,177,228	329,223,291	128,359,668	31,355,284
Alaskan Area	175,750,000	-	-	2,162,191	-	175,000,000	-	2,162,191	-	2,162,191
Canadian Area	101,368,972	379,095	-	16,193,122	-	61,420,997	-	77,993,214	33,458,332	-
Subtotal, All Areas	813,289,367	3,497,070	82,701,753	269,408,230	132,630,620	289,963,545	6,177,228	339,222,291	161,818,000	33,507,475
Agreements Dated on or After November 10, 1971, but Prior to December 29, 1972 (Schedule I(b))										
"Lower 48" States	183,437,294	1,097,272	897,642	5,367,825	120,250,122	44,098,151	2,660,358	174,411,883	40,506,792	6,836,410
Alaskan Area	91,631,335	3,381,113	-	3,902,592	6,000,000	-	-	13,263,703	15,000,435	386,588
Canadian Area	200,000,514	-	-	-	30,000,000	314	-	30,000,314	-	-
Subtotal, All Areas	477,320,943	4,478,385	897,642	9,270,420	156,250,122	44,098,165	2,660,368	217,676,102	55,507,227	7,222,998
Agreements Dated on or After December 29, 1972, but Prior to December 28, 1973 (Schedule I(c))										
"Lower 48" States	836,743,722	2,884,222	-	434,666,115	178,600,509	29,532,650	87,500,000	733,183,466	12,593,465	348,000
Alaskan Area	40,435,607	-	-	23,686,001	12,500,000	-	-	36,186,001	-	-
Canadian Area	16,753,229	6,358,216	-	-	-	-	-	6,358,216	-	-
Subtotal, All Areas	913,932,918	9,242,438	-	458,352,116	191,100,509	29,532,650	87,500,000	797,729,683	12,593,465	348,000
Agreements Dated on or After December 28, 1973 (Schedule I(d))										
"Lower 48" States	493,017,451	4,072,222	929,515	172,047,272	113,034,676	17,942,858	3,716,450	313,743,393	4,312,716	187,500
Alaskan Area	-	-	-	-	-	-	-	-	-	-
Canadian Area	-	-	-	-	-	-	-	-	-	-
Subtotal, All Areas	493,017,451	4,072,222	929,515	172,047,272	113,034,676	17,942,858	3,716,450	313,743,393	4,312,716	187,500
Total, All Periods										
"Lower 48" States	2,069,810,862	11,171,491	84,528,910	683,136,132	546,555,927	160,116,677	100,000,476	1,270,362,013	185,772,861	30,737,794
Alaskan Area	309,287,802	3,381,113	-	11,724,191	18,500,000	175,000,000	-	228,613,507	15,000,435	386,588
Canadian Area	337,868,015	6,717,311	-	16,193,122	30,000,000	61,420,997	-	116,531,944	43,458,387	-
Total, All Areas	2,697,586,679	21,270,115	84,528,910	921,040,088	595,055,927	306,537,674	100,000,476	1,615,500,261	244,231,688	41,124,382

UNITED STATES OF AMERICA

BEFORE THE

FEDERAL POWER COMMISSION

EL PASO ALASKA COMPANY, et al.) Docket No. CP75-96, et al.

POSITION BRIEF OF THE PEOPLE
OF THE STATE OF CALIFORNIA AND
THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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State of California and the Public
Utilities Commission of the State
of California.

December 3, 1976

UNITED STATES OF AMERICA

BEFORE THE

FEDERAL POWER COMMISSION

EL PASO ALASKA COMPANY, et al.) Docket No. CP75-96, et al.

POSITION BRIEF OF THE PEOPLE
OF THE STATE OF CALIFORNIA AND
THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

To the Presiding Administrative Law Judge:

The People of the State of California and the Public Utilities Commission of the State of California (CPUC) hereby submit a "position" brief in response to a notice dated November 2, 1976 by the Presiding Administrative Law Judge requesting the "position of parties other than applicants on all issues." 1/

INTRODUCTION

To date the CPUC has submitted briefs relating to "applications and conditions" proposed by the applicants; the siting of a LNG regasification facility in California, assuming certification of the El Paso Alaska project; the need for "western leg" facilities, assuming certification of the Arctic Gas or Alcan project; and the tariffs proposed by each of the applicants, assuming certification of their respective projects.

To date the CPUC has not filed specific briefs on the following issues: environmental, geotechnical, Canadian laws and treaty, cost-of-service allocation between the United States and Canada, economic (construction scheduling, capital costs, cost-of-service), socio-economic, net national economic benefit and financing. The subject "position" brief will discuss the CPUC's position as to some of these issues as they relate to the CPUC's preference for a system to transport natural gas from Prudhoe Bay and the Mackenzie Delta.

1/ On November 23, 1976 the Presiding Law Judge granted the CPUC an extension of time to December 3, 1976 to mail its "position" brief due to the illness of the CPUC's counsel.

Despite the fact that the record contains approximately 45,000 pages of transcript and several thousand pages of exhibits and testimony, several question marks still exist with respect to each of the proposed systems. The real problem is, however, that the majority of these unresolved questions will not be answered until at least one of the projects is approved, financed and construction commences. For example, each of the applicants has labored extensively to provide capital cost and cost-of-service estimates of their respective systems and to cross-examine the estimates of their competitors. After analyzing these estimates, the CPUC has reached the conclusion that for all practical purposes the cost-of-service to its consumers may be a virtual stand-off among the three systems, and that the difficult policy decision which must be made at this time must be based on factors other than "costs" alone.

At the same time, the CPUC would be negligent in not pointing out that no matter which system is certificated, the cost of transportation to the California consumers may range from \$1.50/MMBtu to \$2.30/MMBtu, based on July 1, 1975 costs, assuming no cost overruns. Of course these estimates exclude the wellhead price of the gas, as well as the costs for gathering, treating and processing the gas prior to its delivery into the main transportation system.

The CPUC is making its decision based on the best evidence of record to date. The procedures set forth in the "Alaskan Natural Gas Transportation System Act of 1976" provide that the President and Congress will make the final decision as to the most appropriate system, if any, to transport Alaskan gas to the lower 48 states. If additional evidence becomes available prior to the time the President or Congress make their decisions, which in the CPUC's mind requires a change of position, it will not hesitate to speak its mind.

Based on the evidence of record in this proceeding, the CPUC believes that the Arctic Gas system, as presently proposed by the applicants, would best serve the interests of the natural gas consumers of California and the United States.

I.

GROUND'S FOR CPUC'S PREFERENCE FOR ARCTIC GAS SYSTEM

A. Gas Supply and Deliverability

At the outset the CPUC wishes to comment on the gas supply and deliverability assumptions set forth in the briefs filed by the applicants, the Commission Staff and the State of Alaska.

It is a truism that the size and design of a gas pipeline transportation system is dependent on the volumes of gas that will be delivered into the pipeline system. The CPUC believes that a transportation system to be constructed in the Arctic regions of North America should be designed to transport not only presently proven salable reserves but "probable" or "potential" reserves, assuming there exists some realistic basis for making the "probable" or "potential" reserve estimates. In this proceeding there is evidence to the effect that daily gas deliveries from Prudhoe Bay for twenty years after commencement of a transportation system may vary from 2.0 Bcf/d to 4.4 Bcf/d, based only on proven reserves in the Prudhoe Bay Field. In this respect it should be noted that only the Alcan sponsors estimate initial deliveries below 2.0 Bcf/d. Alcan estimates a maximum average deliverability of 2.0 Bcf/d and submits that a range of 1.2 Bcf/d to 2.0 Bcf/d is reasonable to maximize oil recovery. However, even the major North Slope producers have testified that at least 2.0 Bcf/d to 2.5 Bcf/d of natural gas will be produced from the Prudhoe Bay Field. The actual volumes to be delivered will, of course, depend upon reservoir performance.

Based on the various estimates made by the applicants, the Commission Staff, the Department of Interior, the State of Alaska and the major North Slope producers, the CPUC believes that an estimate of 2.0 Bcf/d to 2.5 Bcf/d of natural gas from the Prudhoe Bay Field, based on proven reserves only, is reasonable. On this ground alone, the CPUC does not believe that it is in the best interests of the natural gas consumers of California to support a transportation system that is presently designed to transport a maximum of 2.4 Bcf/d to 3.1 Bcf/d of natural gas from Prudhoe Bay. As will be discussed infra, the capital costs of each of the proposed projects make them "marginal" for the consumer, assuming daily deliveries of 2.0 Bcf/d to 2.5 Bcf/d. The only factor that seems to lend weight to support any Arctic transportation system appears to be the promise of additional reserves in the not-too-distant future. Without a transportation system designed from the outset to accommodate such additional reserves, it is questionable whether California should support any project to transport natural gas from the Arctic regions of North America. Instead, California's best interests may rest in investing capital in additional lower 48 ventures, both onshore and offshore.

With respect to the Mackenzie Delta area of Canada, there is evidence supporting daily deliveries ranging from .424 Bcf/d to .855 Bcf/d. The primary difference for the variation lies in the inclusion or exclusion of "probable" or "possible" or "potential" reserves. Despite these variations in deliverability projections, it is important to note that at least .424 Bcf/d of MacKenzie Delta reserves could be delivered to Canadian markets via the Arctic Gas project. This would not be the case with either the El Paso Alaska project or the Alcan project. From California's standpoint, once additional "frontier reserves" are available to eastern

Canadian markets, it may lessen the need for the Canadian government to curtail exports to California from Alberta. Once again, such a factor must weigh heavily in any support being given to a system to transport natural gas from the Arctic regions of North America.

B. Effect of Canadian Laws and Treaty

Each of the applicants have filed extensive briefs relating to (1) the timing of Canadian decisions regarding approval of a transportation system through Canada and the granting of rights-of-ways for such a system; (2) the effect of the draft treaty between the United States and Canada; (3) the powers of provincial governments in Canada through which both the Arctic Gas and Alcan projects will traverse to tax the pipeline, notwithstanding the execution of the above-described treaty. In addition to the submission of briefs Arctic Gas and El Paso Alaska sponsored Canadian experts, who underwent extensive cross-examination regarding these issues.

In recommending support of the Arctic Gas project, the CPUC is certainly aware that ultimate approval of this project depends in large measure on Canadian approval of the Canadian Arctic portion of the Arctic Gas project. Such approval, in turn, depends on the Canadian government's decision as to the timing for a pipeline system from the Mackenzie Delta area and the disposition of native claims settlements in the Northwest and Yukon territories of Canada.

If this Commission approves the Arctic Gas project, but the Canadian government decides against it, it would be necessary for the United States to reassess its position. However, in light of the projected schedules set forth in the Alaskan Natural Gas Transportation System Act of 1976, the United States would still have sufficient time to make any necessary readjustment to its position, assuming Canadian denial of the Arctic Gas project. However, the CPUC submits that it behooves the United States to make the Canadian government aware that it is in the best interests of both the United States and Canada to construct a system initially that will transport Prudhoe Bay reserves to the lower 48 states and, at the same time, transport Mackenzie Delta reserves to Canadian markets. The Commission's recommendation of approval for the Arctic Gas project would be the initial step in that direction.

At the present time it appears that the major concerns to the United States of a pipeline transporting Alaskan gas through Canada are twofold:

1. The possibility of the Canadian federal government refusing to allow expansion of the pipeline in Canada in order to transport additional Alaskan reserves to United States markets;

2. The possibility of a provincial government levying a confiscatory ad valorem property tax on that portion of the pipeline within its province. 2/

It appears that a final treaty between the United States and Canada and any legislation necessary to implement a treaty in order to alleviate these problems would be brought to fruition shortly after the United States and Canada chose a transportation system that was in the mutual interests of both countries. Thus, the Commission could approve the Arctic Gas project, subject to the condition that a treaty between the U.S. and Canada be executed, ratified or otherwise implemented which offers some reasonable assurances that none of the provinces through which the Arctic Gas system would traverse will confiscatorily tax the proposed pipeline system and that future expansion of the pipeline system in Canada will not be prohibited arbitrarily by the Canadian government.

In its brief El Paso Alaska sets forth a picture of "horrors" which the Canadian government could implement, notwithstanding a treaty. The CPUC is more persuaded by the arguments of Arctic Gas to the effect that when the Canadian provincial and federal governments see that the Arctic Gas system serves the mutual needs of Canada and the United States, no discriminatory or confiscatory actions will be taken by the governmental entities of Canada with respect to the proposed system. It is in the best interests of the United States to trust our Canadian neighbors. However, if such trust proves to be misplaced, Arctic Gas has described several areas where the United States could retaliate. But, the joint interests of Canada and the United States in constructing and operating a hydrocarbon transportation system, serving both the United States and Canada, in a time of a severe energy shortage make the need for retaliation very unlikely.

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- 2/ When these proceedings commenced, a great deal of conflicting evidence existed with respect to the powers of the provincial governments to act in a discriminatory or confiscatory manner with respect to a pipeline transporting Alaskan gas through Canada, notwithstanding the existence of a treaty between the United States and Canada. However, after extensive cross-examination of witnesses for El Paso Alaska and Arctic Gas (Alcan did not sponsor an expert witness on Canadian law), it appears that fears of interference with construction, operation, repair, use or alteration of the pipeline, expropriation, diversion of supplies and indirect discriminatory taxation by the provincial governments are unfounded.

C. Economic Issues - Capital Costs, Construction Schedules, Cost of Service

Each of the applicants has submitted extensive evidence relating to the capital costs, construction schedules and cost-of-service per unit of their respective systems and the systems of their competitors. The CPUC does not envy the job of the Presiding Law Judge and the Commission in ferreting out this conflicting evidence in order to determine whose estimates are most reasonable. For example, depending upon whose assumptions are being used, the average unit cost-of-service of the three systems range from \$1.25 per MMBtu to \$2.34 per MMBtu.

For our purposes, the CPUC has accepted the estimates of each of the applicants as to the capital costs, construction schedules and cost-of-service of their respective systems summarized in the initial "economic" briefs submitted by each applicant.

Though the CPUC is "accepting" the applicant's estimates as to their respective systems, it submits that each of the applicants is being "conservative" as to its own estimates and "liberal" as to attacks on the estimates of its competitors. As stated above, the CPUC believes that no matter which system is approved, the unit cost of transportation to California markets will range from \$1.50 to \$2.30, excluding the wellhead price of the gas, costs of gathering, treating and processing the gas and costs of distribution. 3/

3/ As Alcan has succinctly stated in its initial "economic" brief, the record presently is devoid of evidence relating to the wellhead price, costs of gathering, processing and distribution (pages 59-64.). Without this information, it is not possible for the Commission to precisely determine the cost of Alaskan gas to the end users in Alaska and in the lower 48 states. In order to satisfy the mandate of Section 5(c) of the Alaskan Natural Gas Transportation Act of 1976, it appears that some type of Phase II hearing will be necessary. However, such a Phase II hearing would not allow sufficient time for the Commission to meet the May 1, 1977 deadline set forth in the Act.

Based on the North Slope producers' statements of record to the effect that they will not enter into gas purchase contracts at least until a gas transportation system is approved, it does not appear that the above-described information required by Section 5(c) of the Act would be available until after the President and Congress have made a decision as to an appropriate transportation system. If this assumption is correct, perhaps the Commission should recommend to Congress that the Act be amended to take these facts into consideration.

1. Capital Costs

The applicants have made the following capital cost estimates for their respective systems:

		<u>Billions of Dollars</u>
El Paso Alaska	-	\$6.57
Arctic Gas	-	\$8.60
Alcan	-	\$6.28

The above-specified capital costs are based on July 1, 1975 dollars, and include AFUDC. The El Paso Alaska estimates assume facilities designed to transport 2.4 Bcf/d from Prudhoe Bay. The Arctic Gas estimates assumes facilities designed to transport 4.5 Bcf/d (2.25 Bcf/d from Prudhoe Bay and 2.25 Bcf/d from the Mackenzie Delta area). Of the above-specified figure \$2,754,114,000 would be the portion of the capital costs chargeable to transport Canadian gas on a mcf-mile basis of allocation. Thus, the total capital costs of Arctic Gas' facilities for transportation of Alaska gas will be \$5,851,756,000. The Alcan estimates assume facilities designed to transport 2.4 Bcf/d from Prudhoe Bay.

It appears that many of the differences between the applicants' estimates and the estimates made by their competitors are well within estimating ranges. Therefore, for purposes of comparison it seems reasonable to accept the estimates of the applicants as to their respective projects. However, based on the experience of the Alyeska oil pipeline, the CPUC submits that the above-specified capital cost estimates are probably conservative. The CPUC is not in a position to forecast which of the proposed projects will suffer more or less cost overruns. Each of the projects face different problems as evidenced by the environmental and geotechnical evidence submitted for the record herein.

For reasons stated herein, the CPUC believes that for approximately the same capital costs to the American consumers, the Arctic Gas system would provide these consumers a more fuel efficient system capable of transporting large additional future reserves from both Alaska and Canada. Neither the El Paso Alaska system nor the Alcan system can promise the same type of performance.

2. Construction Schedules

The applicants have made the following estimates as to construction schedules for their respective systems:

El Paso Alaska -	60 months
Arctic Gas -	66 months
Alcan -	36 months

Both El Paso Alaska and Alcan allege that their projects entail "significantly lowered construction risks" than the Arctic Gas project. Based on the experience of the Alyeska oil pipeline, the CPUC believes that each of the above-described schedules are probably optimistic. However, the CPUC is not in a position to forecast which of the proposed projects will suffer more or less delays.

Assuming the validity of the above-described construction schedules, the issue as to approval of the Arctic Gas project versus the Alcan project becomes one of approving a project which will transport both Prudhoe Bay and Mackenzie Delta reserves initially, with the design capacity to transport significant additional reserves in the future, or approving a project which can transport Prudhoe Bay reserves only and is not designed to transport additional reserves, absent significant additions to plant which, in turn, result in additional fuel loss. It should be noted that the fuel use by the Arctic Gas system will be 6.87% as compared to a fuel use by the El Paso Alaska and Alcan projects of 13.2%. As stated above, the CPUC believes that the best interests of California gas consumers lie in the approval of a project which will at the outset provide for the transportation of both Prudhoe Bay reserves and Mackenzie Delta reserves in a fuel efficient manner, with the capability of transporting significant additional reserves in the future at no additional expense. The CPUC believes that the Arctic Gas project offers such a prospect.

3. Cost-of-Service to California Consumers

Predicated upon their estimates of capital costs and construction schedules, as well as their proposed financing plans, the applicants have made the following estimates as to the unit cost of transportation to the California market for each of their respective systems:

	<u>\$/MMBtu</u>
El Paso Alaska	1.52 to 1.74
Arctic Gas	1.26 to 1.52
Alcan	1.35 to 1.50

As with their estimates of capital costs and construction schedules, the CPUC believes that the applicant's unit cost-of-service estimates are conservative. Also, despite cross-examination of the applicants' witnesses sponsoring these cost-of-service estimates, the CPUC believes that the attacks by the applicants upon their competitors' assumptions almost negate each other. After taking into consideration the "conservative tendency" of each applicant's cost-of-service estimates, the CPUC believes the above-specified ranges indicate a slight advantage of the Arctic Gas project over both the El Paso Alaska or Alcan projects with respect to unit cost-of-service to California.

D. Allocation of Costs Between U.S. and Canadian Consumers

After reviewing the evidence and briefs submitted by Arctic Gas and Alcan with respect to the allocation of costs between U.S. and Canadian shippers using their respective systems, the CPUC believes that both Arctic Gas' and Alcan's methods of allocation are administratively feasible, assuming approval by the NEB of these methods. Because of the greater number of Canadian pipeline systems involved in the Alcan system as compared to the Arctic Gas system, it appears that Arctic Gas' allocation proposals would be easier to administer. However, the CPUC believes that Alcan's brief on the allocation issue makes a persuasive case that its proposed allocation methods are workable and manageable.

E. Environmental and Geotechnical Issues

As the Commission Staff pointed out in its environmental brief, each of the three proposed systems have undesirable environmental impacts. However, like the Commission Staff, the CPUC believes that the Arctic Gas project is environmentally preferable to either the El Paso Alaska project or the Alcan project. ^{4/} The Commission Staff found the El Paso Alaska project to be the least environmentally preferable system, even assuming El Paso Alaska used its realignment alternative. Again, the CPUC agrees with the Commission Staff's conclusion.

As a general matter the major drawback of the Arctic Gas system is that it will disrupt wildlife and ecosystems in the Alaska National Wildlife Range (ANWR). The major shortcomings of the El Paso Alaska project are that it intrudes the Chugach National Forest, its route outside the Alyeska oil pipeline corridor

^{4/} Though the Commission Staff found its Fairbanks Corridor/Red River alternative to be environmentally preferable for transporting Prudhoe Bay reserves only, it found the Arctic Gas project to be the "best environmentally" if Mackenzie Delta gas and Prudhoe Bay gas are both to be considered.

is environmentally unsound; it contemplates locating LNG liquefaction, regasification and marine terminals in seismically sensitive areas of Alaska and California without adequate seismic design to withstand maximum credible earthquakes. The most significant problem with the Alcan system is its inability from the date of completion to transport additional reserves from the Arctic region which are expected to be produced in the future.

The CPUC believes that the fact the Arctic Gas project will traverse the ANWR is offset by the following major factors: First, unless the Arctic Gas system is built, there will be no access to the Mackenzie Delta reserves until at least the late 1980s. Unless the Mackenzie Delta reserves are transported to Canadian markets in the mid-1980s, the possibility of curtailment of Canadian exports to the United States becomes more certain. Neither California, nor many other states in the lower 48 can afford such curtailments of Canadian supplies.

Second, transportation of natural gas by the El Paso Alaska or Alcan systems would be much more energy consumptive than transportation via the Arctic Gas system. For example, assuming California received 650 MMcf/d of Prudhoe Bay reserves, similar to the volumes its local distributors contracted for under the now terminated advance payment agreements with Atlantic Richfield Company (ARCO) and Exxon Company, U.S.A. (Exxon), the fuel usage to deliver these volumes to California under the three proposed systems would be as follows:

<u>Alcan</u>	<u>El Paso Alaska</u>	<u>Arctic Gas</u>
88 MMcf/d	62 MMcf/d	33 MMcf/d

Thus, Alcan would use almost three times as much fuel, and El Paso Alaska almost twice as much fuel, as Arctic Gas to transport the same volumes of gas to California. Alcan would use approximately 160 MMcf/d of natural gas more than Arctic Gas to transport 2400 MMcf/d to the Canadian/Lower 48 border.

Third, the United States is a highly energy-consumptive society. Despite conservation efforts, the United States will continue to use inordinate amounts of fuel, including natural gas. Unless this country is willing to drastically change its life style, and there has been no indication of such a desire to date, it will be necessary to find ways to transport as much energy as possible from areas like the North Slope and Mackenzie Delta. Only the Arctic Gas project offers this opportunity. If traversing the ANWR is a necessary trade-off for this result, the CPUC believes the United States should be willing to make the trade-off, especially when one considers the stringent measures which Arctic Gas has developed to mitigate the impact on the ANWR. Of course, the CPUC, like the

Commission Staff, does not believe that Arctic Gas' proposed mitigation measures will be totally effective. For example, the pipeline will disrupt the "wilderness" value of the ANWR more than at any time in the past. The new technology, like snow roads and chilled pipelines, are susceptible to error, despite the extensive studies already undertaken and still to be undertaken by Arctic Gas. Complete enforcement of the proposed mitigation measures, such as revegetation, may be idealistic. However, if the United States has made a commitment to obtaining substantial volumes of natural gas from the North Slope of Alaska, the CPUC submits that it must be willing to assume some of the risks inherent in transporting these reserves from the Arctic regions.

Fourth, the extensive environmental planning by Arctic Gas, as compared to El Paso Alaska and especially Alcan, gives preference to the Arctic Gas project. Arctic Gas has presented for the record a much more detailed project in terms of engineering and design than either El Paso Alaska or Alcan. While El Paso Alaska and Alcan have much environmental and geotechnical research to do prior to construction, Arctic Gas can proceed to construction based on approximately 150 man years of research.

Fifth, the Arctic Gas system does not traverse as many seismically dangerous areas as either Alcan or El Paso Alaska. In addition, there seems to be insufficient evidence of record to support the technical or economic feasibility of El Paso Alaska's seismic designs. Alcan must still complete substantial studies to define its seismic problems and to determine the precise routing of its system through the Yukon.

Sixth, the evidence of record indicates that each of the applicants will face the problems of frost heave. However, Arctic Gas has conducted much more-detailed studies to deal with the frost heave problem than has either El Paso Alaska or Alcan. If the assumption is correct that the potential for frost heave is greater in areas of discontinuous permafrost, it appears that the Alcan project may have to contend with the potential of frost heave for 584 miles of discontinuous permafrost and 793 miles of fringe discontinuous permafrost, as compared to Arctic Gas with 510 miles of discontinuous permafrost and 290 miles of fringe discontinuous permafrost.

Seventh, Alcan brags about the fact that much of its construction will occur in non-winter months, as compared to Arctic Gas and El Paso Alaska. However, it appears that non-winter construction raises other problems relating to permafrost, namely subsidence, settlement and degradation of the permafrost. Alcan has not adequately described how it will deal with these problems.

Eighth, both Alcan and El Paso Alaska must rely heavily on the Alyeska Pipeline Co. for much of their environmental and geotechnical information. Despite the fact that Alyeska has supplied substantial information to El Paso Alaska and Alcan to date, the possibility of a breakdown of communications exists at any time. Such a breakdown would leave both El Paso Alaska and Alaska "high and dry." Arctic Gas, on the other hand, has during the past eight years built up its own library of information. It need not rely on Alyeska for any important information relating to Arctic Gas' proposed transportation system.

Alcan's major attack against the Arctic Gas system seems to be the fact that Arctic Gas intends to use a high-pressure 48" O.D. pipeline for its project. Alcan claims its "conservative" approach is more certain of success than Arctic Gas' unproven technology. Of course, Alcan fails to note that its "conservative" approach also guarantees an obsolete system upon the date of completion at a cost of \$6 to \$7 billion. The CPUC submits that the extensive research undertaken by Arctic Gas makes its proposal worthy of approval, especially considering that the completion of the Arctic Gas system will provide a system capable of transporting substantial volumes of additional future reserves. Arctic Gas is not a "fly-by-night" operation. It is a consortium of oil and gas companies from the United States and Canada who have built their enterprises on previously untried and unproven techniques. The fact that the technology is not yet "proven" should not mitigate against its acceptance. Rather, it should make the regulator wary of approving a tariff which places all of the risks of cost overruns or project failure on the gas consumer.

Based on the foregoing reasons, the CPUC submits that the Arctic Gas project is environmentally preferable to either the El Paso Alaska or Alcan projects. However, the CPUC requests that any approval of the Arctic Gas project include the conditions set forth in Appendix B of the Commission Staff's initial environmental brief, dated November 19, 1976. In addition, the CPUC agrees with the Commission Staff's request for a "Federal surveillance team to monitor the construction of the certificated pipeline" and some type of enforcement mechanism in the event the construction techniques used violate the conditions set forth in the certificate.

F. Socioeconomic Issues

From a socioeconomic standpoint the State of Alaska places the competing systems in the following order of priority: El Paso Alaska, first; Alcan, second; Arctic Gas, third. Apparently the State of Alaska has decided that the socioeconomic benefits of having a pipeline traverse its State from north to south outweigh the detriments, such as in-migration and resulting unemployment, increased demand for services, and shortages of goods and services.

The CPUC does not doubt that the State of Alaska thinks its support of the El Paso Alaska project is in the best interests of the citizens of Alaska. However, the CPUC must consider the interests of the natural gas consumers in California. For the reasons stated herein, the CPUC believes that the Arctic Gas system would be more beneficial to the People of the State of California than either the El Paso Alaska project or Alcan project.

G. Specific Comparisons Among Competing Systems

In addition to the issues discussed above, a direct comparison between the Arctic Gas system and the El Paso Alaska system and between the Arctic Gas system and the Alcan system provides further evidence why it is in the best interests of the California gas consumers to support the Arctic Gas project.

1. Arctic Gas System vs. El Paso Alaska System

The CPUC favors an overland transportation system, such as the Arctic Gas system, over a combined pipeline/LNG system, such as the El Paso Alaska system, for the following reasons: First, if the El Paso Alaska project is approved, between 60 percent and 80 percent of California's total gas supplies in 1985 would be LNG delivered to West Coast terminal facilities. The exact percentage of LNG would depend on the volumes of other supplemental gas supplies, such as coal gas, Indonesian and Cook Inlet LNG, and gas from El Paso's Algeria II project, received by California.

Reversal of the flow of the pipeline facilities of El Paso Natural Gas Company (El Paso) and Transwestern Pipeline Company (Transwestern) east-of-California to implement the El Paso Alaska project, combined with the possible abandonment of two pipelines in California owned by Southern California Gas Company (SoCal) and two of El Paso's pipelines east-of-California in order to transport Alaskan oil from the West Coast to the midwest (SOHIO West Coast-MidContinent Oil Pipeline Project) may result in the inability of California to receive gas from Texas, New Mexico and the Rocky Mountains in the future, assuming new discoveries are found in these regions. Such a reversal of flow would also make it more difficult to transport additional supplies of coal gas or other SNG from New Mexico, Wyoming or Arizona.

Second, if the El Paso Alaska project is approved, the approval of any other LNG projects, such as the Pacific Indonesia project or the Pacific Alaska project, might require the construction of more than one LNG regasification facility in California and would definitely increase the tanker traffic along the California coast by adding 232 to 308 trips per year by 165,000 cubic meter cryogenic tankers.

Such additional LNG tanker traffic must be considered in conjunction with additional tanker traffic for North Slope oil which will commence by 1978. If additional reserves of North Slope gas become available, an expanded LNG tanker fleet would be required for the El Paso Alaska system. The additional tanker traffic would merely add to the congestion along the California coast, especially in the Santa Barbara Channel, where Outer Continental Shelf development will be in progress.

A proliferation of LNG regasification facilities on the coast of California and additional LNG tanker traffic along the coast of California is not in the best interests of the people of the State of California, when an overland pipeline system exists as a viable alternative to transport gas from the North Slope of Alaska.

Third, the evidence in this proceeding indicates a strong probability that additional reserves will be proven both on the North Slope of Alaska and in the Mackenzie Delta area of Canada. For example, DeGolyer and MacNaughton, consultants for Arctic Gas, have estimated additional potential reserves on the North Slope of Alaska at 41.8 Tcf. The State of Alaska's Division of Geological and Geophysical Surveys has estimated additional potential reserves offshore the North Slope of Alaska at 46.5 Tcf. The Department of the Navy has estimated potential reserves in Naval Petroleum Reserve No. 4 of 78.6 Tcf.

Arctic Gas has estimated potential reserves in the Beaufort Sea near the Mackenzie Delta area of 50 Tcf and introduced into the record testimony by Dome Petroleum Limited before the National Energy Board (NEB) in Canada that potential reserves in the Mackenzie Delta/Beaufort Sea Basin may range from 250 to 320 Tcf. Even if these estimates appear to be somewhat optimistic, it is the potential for those future reserves which the transportation system should be designed to meet. Otherwise, as stated above, it is questionable whether such a large capital investment should be made for only proven reserves already discovered on the North Slope and in the Mackenzie Delta area. The El Paso Alaska project is not designed to transport any of the Mackenzie Delta reserves. In order to transport additional North Slope reserves, it will be necessary to expand its LNG operations. As stated above, it is not in California's best interest to support a proliferation of LNG facilities when a viable alternative exists to transport not only North Slope gas but also Mackenzie Delta gas. This is especially true where the transportation of the Mackenzie Delta gas might lead to a continuation of exports of Canadian gas to California and other states in the lower 48 which are dependent on Canadian gas supplies.

Fourth, despite the numerous safety factors proposed for the El Paso Alaska system, the potential for harm to persons and property is greater from an LNG system than an overland pipeline system, especially where the proposed sites for the liquefaction and regasification facilities lie in areas of potential seismic activity.

Fifth, a greater probability of "outages" exists from an LNG operation than from an overland pipeline system. For example, storms, fog or other forms of bad weather could delay a LNG carrier for several days. Mechanical breakdowns of tankers, liquefaction and regasification facilities are more likely to occur and are more difficult to repair than an overland pipeline system because of the complexity of an LNG system as compared to a pipeline system. Finally, maritime union problems are certainly possible for a Jones Act LNG fleet, notwithstanding the execution of "no strike" contracts.

El Paso Alaska has attempted to counter the "outages" problem by showing that it can technologically reverse the flow of the pipeline system from "west-to-east" to "east-to-west" within 8 hours in the event of an outage which affected LNG deliveries into the West Coast terminal. El Paso Alaska believes that this technological contingency should assuage any fears which California may have concerning insufficient supplies of gas to California, assuming an LNG "outage". Unfortunately, the CPUC is still much concerned that other states east-of-California would not be amenable to having their supplies of gas cut-off in case of a LNG outage which adversely affected California. Even assuming their willingness to aid a sister state in distress, El Paso Alaska would be merely prorating the effect of the outage. The fact remains that the probability of a severe outage is greater with a LNG system than an overland system, and that in the event of an outage some natural gas consumers in the lower 48 states will suffer. The CPUC does not see the justification for taking these risks when a viable overland system exists to transport the North Slope reserves.

2. Arctic Gas System vs. Alcan System

The CPUC supports the Arctic Gas system rather than the Alcan system for the following reasons: First, the Alcan system is not designed to transport Mackenzie Delta reserves. Absent the transportation of Mackenzie Delta reserves to Canadian markets, curtailment of present Canadian exports to California is more likely. The CPUC prefers a system which will give more assurance that exportation of Canadian gas will continue at present levels, and the Arctic Gas system, rather than the Alcan system, provides this greater assurance.

Though it is true that a combination of the Maple Leaf and Alcan projects would provide a transportation system for Mackenzie Delta reserves, as well as Prudhoe Bay reserves, a Maple Leaf/Alcan system would require approximately 2000 more miles of pipeline than the Arctic Gas system and would not have the cheap expansability of the Arctic Gas system in the likely event that additional reserves are proven on both the North Slope and in the MacKenzie Delta area.

From an environmental standpoint, it is not in the public interest to approve a system which would require extensive additional mileage of pipeline through mountainous regions when a much shorter and more direct pipeline system is set forth as an alternative.

Second, in order to be able to finance both the Alcan project and the Maple Leaf Project, Alcan's witnesses have testified that they would have to urge the Canadian government to separate the construction of both projects by at least 16 months. However, these same witnesses have testified that the Maple Leaf project has a priority status in Canada over any other proposed project, because the Maple Leaf Project serves Canadian interests only, as opposed to any of the other proposed projects pending before the NEB whose main interests are in serving the needs of lower 48 customers. If the Maple Leaf project has such a priority status, it seems doubtful whether the Canadian government would postpone its construction in favor of constructing the Alcan project which serves only lower 48 customers. In addition, the capital needed to build the Maple Leaf project may not leave sufficient capital to finance the Alcan project. The CPUC submits that Alcan has not carried its burden of proving that its project could be financed within the time frame it proposes.

Third, the Alcan system will build upon already existing low-pressure pipeline facilities for a major portion of its system. To increase the design capacity of the proposed Alcan system to 2400 MMcf/d will require much additional compression and increased fuel use to transport the gas. The CPUC estimates that the Alcan system would use 160 MMcf/d more gas to transport 2400 MMcf/d than would the Arctic Gas system. To put this figure in perspective, the 160 MMcf/d would be equivalent to the volumes of gas already committed to Southern California Gas Company for its Cook Inlet project. The 160 MMcf/d of gas is also equivalent to 30,000 bbl/d of oil.

To argue that Alcan could use a higher pressure system for its Canadian facilities, if necessary, fails to recognize the major purpose for the Alcan project, namely to utilize existing low-pressure facilities which may have idle capacity to transport Alaskan reserves.

Fourth, as stated above, the economics of both the Arctic Gas and Alcan projects are very near the point where it would be more cost effective for California to pursue alternate sources of gas. In addition, there is a substantial chance of cost overruns for either project. The major attraction of a North Slope gas transportation system at this time is the probability of the discovery of substantial new reserves. This could be expected to provide more gas to California and to improve the economic viability of a pre-existing transportation system. The Arctic Gas system, with its much larger capacity, could take advantage of new sources, whereas the Alcan project could not do so as cheaply or as effectively.

H. Tariffs

The CPUC has discussed the tariffs issue in its initial tariff brief dated June 30, 1976 and in its reply tariff brief dated December 3, 1976. Therefore, the CPUC will not repeat its general position regarding the tariff mechanisms proposed by the applicants. However, it should be noted that the sponsors of the Alcan project are requesting approval of a cost-of-service tariff which will charge consumers during the early build-up period of the Alcan project for gas which they will not receive. The sponsors of the Arctic Gas project and El Paso Alaska project, on the other hand, are requesting a phased tariff procedure which would charge consumers a cost-of-service only for the gas they receive even during any build-up period. The CPUC believes that the phased tariff procedure is preferable for California gas consumers in that these consumers will not be charged for gas which they may not receive at a later time. This is especially true in the event certain customers receiving initial volumes of Alaskan gas are later curtailed or removed from the system as a result of an allocation program.

I. Financing

In its brief dated June 30, 1976, relating to El Paso Alaska's financing brief, the CPUC stated its belief that absent capital contributions or some type of backstopping by the North Slope producers and/or the federal and state governments, neither the Arctic Gas or El Paso Alaska projects would obtain financing for their projects. At the time of the CPUC's statement, the Alcan project was not a part of the instant proceedings. However, the CPUC's previous statement is equally applicable to the Alcan project.

The CPUC is aware of recent testimony submitted by the Department of Treasury with respect to methods of financing any of the proposed projects (Vol. 250). The Presiding Law Judge has scheduled December 7, 1976 as the date for the filing of reply financial briefs. After analyzing these reply briefs, the CPUC may deal in more depth with the financing issue as part of the "wrap-up" brief which is due on December 15, 1976. However, at this point the CPUC remains convinced that in order to finance any of these projects, risk sharing between consumers, shippers and producers will be necessary, as well as some form of governmental backstopping of the project, in case of failure of completion or excessive cost overruns.

II

NECESSITY FOR "WESTERN LEG" FACILITIES AS PART OF ARCTIC GAS PROJECT

The CPUC has already submitted a brief stating its reasons for opposing the Commission Staff's recommendation that the Arctic Gas system not include direct delivery facilities from Caroline Junction, Alberta to California. ^{5/} Therefore, the CPUC will not repeat its contentions at this time. Suffice it to say that the CPUC supports the Arctic Gas system, including the PGT facilities, as presently proposed by the applicants.

III

VIEWS OF CALIFORNIA ENERGY RESOURCES, CONSERVATION AND DEVELOPMENT COMMISSION REGARDING ALASKAN NATURAL GAS TRANSPORTATION SYSTEM

In order to carry out its mandate of representing the People of the State of California and in order to present the Commission with the views of all California agencies who have stated a desire to have their views expressed in this proceeding, the CPUC hereby incorporates by reference the attached resolution adopted by the California Energy Resources, Conservation and Development Commission (Energy Commission) (Appendix A). The resolution indicates that the Energy Commission requests that the Commission recommend an overland pipeline system which includes a western leg for direct delivery to California and which "most closely incorporates the following characteristics":

- 1) Earliest possible completion date;
- 2) Lowest cost of service;
- 3) Least environmental impact particularly including impact on sensitive wildlife areas;
- 4) Provides access to the largest deliverable gas supplies;
- 5) Relies on proven pipeline construction techniques;

^{5/} See Brief of the People of the State of California and the Public Utilities Commission of the State of California In Response To Brief of the Federal Power Commission Staff On Arctic Gas Project Western Lateral To California, dated September 29, 1976.

- 6) Maximizes the use of existing rights-of-way;
- 7) Provides an acceptable financing plan requiring the least possible governmental subsidies;
- 8) Provides the most direct delivery system for California;
- 9) Enjoys the committed support of both the United States and Canadian governments;
- 10) Provides the greatest incentives for maintaining continued access to Canadian gas already contracted with California consumers.

IV

LNG SITING ISSUE ASSUMING APPROVAL OF EL PASO ALASKA PROJECT

On August 6, 1976 and October 6, 1976 the CPUC submitted initial and reply briefs relating to the issue of siting a LNG regasification facility on the coast of southern California, assuming the El Paso Alaska project, as opposed to either the Arctic Gas project or the Alcan project, was recommended for approval by the Commission. In its briefs the CPUC concurred with the positions of the Commission Staff and the Sierra Club that Oxnard, rather than Point Conception, was the preferable site for a regasification facility, assuming certification of the El Paso Alaska project. However, the CPUC questioned the conclusions of the Commission Staff and the Sierra Club that only one regasification facility would be necessary, assuming certification of the three projects currently pending before the Commission to bring LNG to California, namely the El Paso Alaska project, the Pacific Indonesia project and the Pacific Alaska project.

Certain state agencies and legislators in California have taken exception to the positions stated by the CPUC in the above-described briefs. In order to carry out its mandate of representing the People of the State of California and in order to present the Commission with as complete a record as possible in the subject proceeding, the CPUC incorporates by reference herein the attached resolutions adopted by the Energy Commission (Appendix A) and the California Coastal Zone Conservation Commission (Appendix B).

The Energy Commission specifically contends that the CPUC acted prematurely in choosing Oxnard as the preferable site for the El Paso/Alaska project for the following reasons: First, the public safety factor regarding the proposed facilities at Point Conception, Oxnard and Los Angeles Harbor is still undetermined. The risk assessment studies prepared by Science Applications, Inc. (SAI) for all three facilities and submitted for the record by Western Terminal LNG Company (Western Terminal) as Exhibits WL-51, WL-52, and WL-53 were based on preliminary data and anticipated design (Tr. 25178). The SAI studies were published in December 1975, and do not fully reflect certain critical engineering details and design progress. For example, seismic analysis for the Oxnard marine facility was completed in July 1976, and the related gimbal joint study was completed in September 1976.

Second, disagreement exists between the Commission staff and SAI regarding the behavior of LNG vapor clouds and other key risk determinants, such as marine vessel traffic. Attention is directed to a letter from the Commission staff to Western Terminal, dated October 26, 1976, in Western LNG Terminal Company, Docket No. CP75-83-2, requesting additional information as to 21 technical points relating to the SAI risk assessment studies and models and assumptions upon which those studies were based. The information requested in this letter indicates that several important areas relating to public safety remain unanswered.

Third, witnesses for Western Terminal stated that they were convinced "internally" that the proposed facilities "presented no undue hazard to the public" and that SAI's risk assessment studies were performed primarily for "defense in permit proceedings", and for the purpose of "convincing the public" (Tr. 24959). Witnesses for SAI stated that no changes in design or operations were suggested because "the risks were extremely low and therefore there was no reason to suggest any changes in the design". Western Terminal did not produce "internal" studies or documents which led them to the conviction that the facilities were acceptably safe, prior to completion of the SAI risk assessment studies. Therefore, the SAI work must be treated as an advocacy document until such time as technical review by qualified, independent peers has established its scientific validity. This review process has only just begun. SAI's conclusions and methods have not been shown to enjoy general acceptance in the scientific community, and they have not been accepted or relied upon by any identifiable authority other than Western Terminal.

Fourth, contingency planning appears woefully inadequate to assure public safety in the event of a major safety incident, however unlikely.

Fifth, pre-permitting safety review must be regarded as preliminary and inconclusive. For example, the review conducted for the Commission by the National Bureau of Standards was only a preliminary step; many critical issues were not and could not be addressed because of the preliminary status of engineering work. Other problem areas were identified but, based on information and belief, responses were left open-ended. It has not been adequately established that safety monitoring in the post-permitting phase, from final design through construction and operation, will be adequately provided for. The recently enacted California Coastal Act (California Public Resources Code, Section 30000, et seq.) will require positive findings that any LNG facility proposed for siting in a populated area is consistent with public safety. The California Coastal Commission intends to exercise this responsibility.

Sixth, additional studies are being conducted within California, regarding all three of the proposed sites for LNG regasification facilities. A preference for any site would be premature, until these studies are completed. For example, the City of Oxnard recently issued a Draft Environmental Impact Report (EIR) regarding Western Terminal's proposed facility at Oxnard. The first public hearing regarding the Draft EIR was held on November 4, 1976. A Final EIR for the project is required by the California Environmental Quality Act (California Public Resources Code, Section 21000, et seq.) prior to the issuance of any local or state permits. Also, from a public policy point of view, completion of the State EIR process appears indispensable to a decision as to the acceptability of Oxnard as a site for a LNG regasification facility.

At this point, it should be noted that in preparing its Draft EIR, the City of Oxnard had an independent safety study performed. It refused to rely on the SAI risk assessment study to establish the safety of the proposed facility at Oxnard. Based on information and belief, a Final EIR for the Oxnard facility will be certified in March or April, 1977. The Final EIR for the Oxnard facilities will be submitted to the FPC as soon as it has been certified.

The preparation of an EIR for the proposed Point Conception site has recently begun. The reason for the delay has been Western Terminal's failure to file the necessary applications with the County of Santa Barbara until just recently. As stated above, with respect to the Oxnard EIR, completion of the State EIR process is indispensable to a decision regarding the acceptability of Point Conception as a site for a LNG regasification facility.

By Order dated May 19, 1976, the Federal Power Commission denied petitions by the CPUC and the County of Santa Barbara for local hearings regarding the proposed LNG facilities at Los Angeles Harbor, Oxnard and Point Conception. At the same time, it has granted requests for local hearings at other sites in the lower 48 states, e.g., Everett, Massachusetts. After the Commission has denied the requests of state and local agencies for local hearings in California, it would be premature for California to endorse any site until the

various State EIR processes have been completed. After the Oxnard and Point Conception EIRs have been subject to local public hearings and local exposure, there will be a better indication as to which site, if any is more acceptable for a LNG facility. Also, until the Oxnard and Point Conception EIRs have had such local exposure, it seems premature to argue, as the CPUC did, that the possibility of injunctive action is more likely at Point Conception than at the other proposed locations.

The issue of seismic safety is presently under detailed technical review by the California Seismic Safety Commission (Seismic Safety Commission). The Seismic Safety Commission expects to issue an official report regarding each of three proposed sites by the end of 1976. 6/ Design data presented to this Commission in the El Paso Alaska or Pacific Indonesia proceedings has been preliminary in many respects. For example, important studies relating to the design of the trestle at Oxnard were only completed in September, 1976. These studies have not been submitted for the record in either the El Paso Alaska or Pacific Indonesia proceedings. Until the Seismic Safety Commission has completed its study as to the proposed sites at Point Conception, Oxnard and Los Angeles Harbor, judgment as to the seismic issues should be reserved.

The Energy Commission is preparing a study relating to the issues of reliability of the proposed LNG regasification facilities. The study will be completed by the end of 1976 and will be available for presentation in the Pacific Indonesia and/or Pacific Alaska proceedings.

Finally, the California Coastal Act includes a strong presumption in favor of remote siting, with the burden of proof on the applicant to establish safety. The above-described EIRs for Oxnard and Point Conception will be a vital element of state decision-making for all state permitting agencies, particularly the Coastal Commission and State Lands Commission, with respect to both safety and environmental issues. Since the County of Santa Barbara has not adopted the Commission staff's Final EIS in the El Paso Alaska proceeding, it would be inappropriate to base a site preference on the Commission staff's environmental analysis which downgrades Point Conception.

6/ It should also be noted that the U.S. Navy, acting through its Naval Facilities Engineering Command, has actively participated in technical discussions relating to seismic issues with respect to both the Los Angeles Harbor and Oxnard sites. Based on information and belief, the Navy has intervened in the Pacific Indonesia and Pacific Alaska proceedings because of the proximity of major naval facilities to both Oxnard and Los Angeles Harbor. In its recent comments on the Draft EIS for the Pacific Alaska project, the Navy agreed with the Commission Staff's conclusion that "the LNG terminal facilities should not be constructed at the proposed Los Angeles site in view of the seismic problem, the shipping congestion in Los Angeles Harbor and the resulting threat to a highly populated area."

Based on the foregoing, the Energy Commission submits that if this Commission recommends approval of the El Paso Alaska project, it should approve siting of the El Paso Alaska project at a remote site consistent with the California Coastal Act and the California Environmental Quality Act. The proposed sites at Los Angeles Harbor and Oxnard are not remote. Some remote site, on or offshore, should be approved by the FPC subject to the condition that a permit be obtained from the California Coastal Commission. In addition, the Commission should take cognizance of the California Resources Agency's concerns on the environmental issues at each of the proposed sites. 7/

If the El Paso Alaska project is not certificated, the Energy Commission would recommend siting a facility at some remote location (either onshore or offshore) for both the Pacific Alaska and Pacific Indonesia projects, until the unanswered safety questions are resolved by the appropriate California agency. These recommendations are without prejudice to the possible siting of a facility at Oxnard, depending on the development of the record in the Pacific Indonesia proceeding.

Some clarification of the intent of paragraph 7 of the Energy Commission resolution (Appendix A) appears necessary in order to conform the resolution's language to the Commission's mandate under the Natural Gas Act.

Paragraph 7 of the Energy Commission resolution reads as follows:

"7) That, however, if the Federal Power Commission should approve the El Paso Alaska proposal and must, therefore, select one of the three proposed California sites in the El Paso/Alaska proceeding, it should tentatively approve a site subject to:

"a. Permit approval by the State Coastal Commission and review by the State Seismic Safety Commission;

"b. Strict permit conditions which prohibit unrelated secondary (or induced) industrial and residential development adjacent to the site or within a "fire hazard" radius of the site; and

7/ See Comments filed by California Resources Agency as to the Commission Staff's Draft Environmental Impact Statement and Final Environmental Impact Statement in the El Paso Alaska proceeding and the Draft Environmental Impact Statements in the Pacific Indonesia and Pacific Alaska proceedings.

"c. Completion and evaluation, including public hearings of the expanded alternate site analysis for the Point Conception EIR."

In its initial brief on LNG siting, the CPUC urged that any certificate for the El Paso Alaska project include language similar to that found in Opinion No. 622 (Columbia LNG Corp., et al., Docket No. CP71-68, et al.), to wit:

"The authorizations granted herein shall not take effect as to any part of any facility, or operation of any part of any facility, until all necessary federal, state and local authorizations as to that part of the facility, or operation thereof, have been secured. A copy of each such authorization for each facility or part thereof, shall be submitted to the Commission prior to the commencement of service of such facility or part thereof. Such authorizations shall include, but are not limited to, building permits, Coast Guard clearances of vessels and harbor operations, and statements of compliance with applicable industry codes or regulatory codes governing the design, construction and operation of facilities in a safe manner." (Ordering Paragraph F(3).)

The CPUC submits that paragraphs 7(a) and (b) of the Energy Commission's resolution (Appendix A) is merely an extension of the principle set forth in the above-quoted condition. The resolution requests that any certificate of public convenience and necessity issued by the Commission for the El Paso Alaska project be conditioned on the issuance of appropriate local and state permits. These local or state permits, in turn, may include conditions which prohibit unrelated secondary (or induced) industrial and residential development near the site. However, the CPUC must point out the difficulties it sees in forcing third parties other than the applicant to limit the growth of the surrounding area. It seems that the feasibility of such a permit condition by a state or local agency rests in the eminent domain power of the applicant, as a public utility, to condemn property in the surrounding area so as to avoid secondary development.

Paragraph 7(c) of the Energy Commission resolution (Appendix A) merely highlights a point made previously, namely that approval of Point Conception be conditional upon completion of the CEQA EIR proceedings now underway within the County of Santa Barbara. Based on information and belief, the Point Conception EIR being prepared by the County of Santa Barbara will include an alternate site analysis of offshore as well as onshore sites, and the Energy

Commission requests that this alternate site analysis be completed prior to any final approval of Point Conception as a site for the El Paso Alaska project, assuming that project is approved by the Commission. Again, the intent of paragraph 7(c) of the Energy Commission resolution seems to be included in the above-quoted condition which the CPUC has already asked the Commission to include in any certificate for the El Paso Alaska project.

At this point it should again be stressed that the CPUC is requesting that the Commission approve the Arctic Gas project, as presently proposed by the applicants. Prior to the time of the Commission's final action in this proceeding, it is very probable that the records in the Pacific Indonesia and Pacific Alaska proceedings will have closed. If additional evidence is introduced into the record of these proceedings which indicates that Oxnard is not in fact the most-preferable location for an initial LNG regasification facility in California, the CPUC will certainly not be adverse to altering its position. However, based on the evidence of record herein, the CPUC still believes that Oxnard is preferable to Point Conception as a site for a LNG regasification facility for the El Paso Alaska project. Hopefully, however, the Commission's choice of the Arctic Gas project will make any choice between Oxnard and Point Conception or any other location moot at least as far as this proceeding is concerned.

CONCLUSION

The CPUC respectfully urges the Commission to recommend approval of the Arctic Gas project, as presently proposed by the applicants.

Respectfully submitted,

/s/ RICHARD D. GRAVELLE

Richard D. Gravelle

/s/ J. CALVIN SIMPSON

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Attorneys for the People of the
State of California and the Public
Utilities Commission of the State
of California

Dated: December 3, 1976

APPENDIX A

RESOLUTION NO.:

STATE OF CALIFORNIA

**State Energy Resources
Conservation and Development Commission**

RESOLUTION

WHEREAS the California Public Utilities Commission has been directed by recent state legislation (SB 2008) to "represent the united interests" of (state agencies) in federal regulatory energy proceedings and to consult with state agencies, specifically the ERCDC (Section 5401 of the Public Utilities Code); and

WHEREAS the ERCDC staff has prepared or in preparation comprehensive reports designed to identify emerging trends related to energy supply, demand, and conservation and public health and safety factors pursuant to Section 25309 (the Warren-Alquist Act) "to provide the basis for state policy and actions in relation thereto"; and

WHEREAS ERCDC staff has acquired and analyzed information in order to ascertain future energy problems and uncertainties including:

- (a) The production of Alaskan North Slope oil and its projected use in the State;
- (b) Impacts of petroleum price increases and projected conservation measures on the demand for energy and indirect effects on the need for offshore oil development and Alaskan oil delivery into the State;
- (c) Potential shipments of Alaskan oil through the State;
- (d) The impact on the State of national energy policies including Project Independence and its successors;
- (e) Implications of natural gas decision making for California in accordance with Section 25005.5 of the Public Resources Code (SB 1479); and

WHEREAS the CPUC, in consultation with the Governor's Office of Planning and Research and ERCDC staff, has established procedures for consultation with other state agencies in federal energy proceedings; and

WHEREAS the CPUC will file a final brief in the El Paso Alaska case by November 30, 1976, which will set forth a statement of policy, based upon the record before the FPC, of other state agencies (CPUC telegram, October 28, 1976);

THEREFORE BE IT RESOLVED that the General Counsel's Office, in coordination with the Executive Director and Commission staff, shall recommend to the Commission appropriate responses to CPUC's request for assistance and to have evidence, expert witness(es), and statements of policy prepared when appropriate for the following federal regulatory energy proceedings (described in depth in attachments) pursuant to the ERCDC's consultation responsibilities according to the provisions of SB 2008:

1. El Paso Alaska Company, FPC Docket No. CP75-96, et al.;
2. Pacific Indonesia LNG Company, FPC Docket No. CP75-160, et al.;
3. El Paso Natural Gas Company, FPC Docket No. CP75-362;
4. Proposed Rulemaking for Approved States' Coastal Zone Management Program, FPC Docket No. RM76-38;
5. Request for Rulemaking on LNG Site Selection Criteria, FPC Docket No. RM76-13;
6. Pacific Alaska LNG Company, FPC Docket No. CP75-140;

THEREFORE BE IT RESOLVED that the Energy Resources Conservation and Development Commission finds that an overland pipeline delivery system for natural gas from Alaska's North Slope including a western leg for direct delivery to California should be selected by the Federal Power Commission which most closely incorporates following characteristics:

- 1) Earliest possible completion date;
- 2) Lowest cost of service;
- 3) Least environmental impact particularly including impact on sensitive wildlife areas;
- 4) Provides access to the largest deliverable natural gas supplies;
- 5) Relies on proven pipeline construction techniques;
- 6) Maximizes the use of existing rights-of-way;
- 7) Provides an acceptable financing plan requiring the least possible governmental subsidies;
- 8) Provides the most direct delivery system for California;
- 9) Enjoys the committed support of both the United States and Canadian governments;
- 10) Provides the greatest incentives for maintaining continued access to Canadian gas already contracted with California consumers.

- 3) That given the current state of knowledge concerning LNG safety, the proposed Oxnard and Los Angeles LNG terminal sites should not, at the present time, be considered "remote from human populations concentrations";
- 4) That the State of California has a law and a process (the California Coastal Act, SB 1277) for resolving LNG-related land use, environmental, and safety questions and for issuing coastal permits for LNG terminals;
- 5) That it would be inappropriate for California to advocate a specific remote site (on or offshore) until such time as the state has completed its environmental impact, supply contingency, and seismic and LNG safety studies;
- 6) That certification of an overland natural gas pipeline system is in California's and the national interest, in part because diversification of supply sources minimizes risks and enhances the reliability of energy delivery systems; and
- 7) That, however, if the Federal Power Commission should approve the El Paso Alaska proposal and must, therefore, select one of the three proposed California sites in the El Paso/Alaska proceeding, it should tentatively approve a site subject to:
 - a. Permit approval by the State Coastal Commission and review by the State Seismic Safety Commission;

- b. Strict permit conditions which prohibit unrelated secondary (or induced) industrial and residential development adjacent to the site or within a "fire hazard" radius of the site; and
- c. Completion and evaluation, including public hearings of the expanded alternate site analysis for the Point Conception EIR.

Dated: November 18, 1976

STATE ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION



Richard L. Maullin
Chairman

APPENDIX B

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CALIFORNIA COASTAL ZONE CONSERVATION COMMISSION

1540 Market Street, San Francisco 94102 — (415) 557-1001

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LEGAL DIVISION

EL PASO ALASKA CO. et al. (Docket No. CP75-96, et al.)

WHEREAS, on November 4, 1976, the California Coastal Zone Conservation Commission, by resolution adopted by unanimous vote, authorized the staff to transmit the following to the Federal Power Commission:

WHEREAS, the California Public Utilities Commission has submitted a reply brief to the Federal Power Commission in the matter of El Paso Alaska Company, et al. (Docket No. CP75-96, et al.).

WHEREAS, the reply brief contains the following statement:

"California continues to support Oxnard as the most preferential location for the first regasification facility on the coast of southern California."

WHEREAS, the California Legislature adopted and the Governor signed into law on September 30, 1976, the California Coastal Act of 1976, which establishes the California Coastal Commission and directs the Commission to approve, deny or condition permits for development, including LNG facilities, on the coast of California in accordance with the policies in the Act.

WHEREAS, among the policies in the California Coastal Act of 1976 that the Commission must use to evaluate any permit for an LNG facility is the following:

"Only one liquefied natural gas terminal shall be permitted in the coastal zone until engineering and operational practices can eliminate any significant risk to life due to accident or until guaranteed supplies of liquefied natural gas and distribution system dependence on liquefied natural gas are substantial enough that an interruption of service from a single liquefied natural gas facility would cause substantial public harm.

"Until the risks inherent in liquefied natural gas terminal operations can be sufficiently identified and overcome and such terminals are found to be consistent with the health and safety of nearby human populations, terminals shall be built only at sites remote from human population concentrations. Other unrelated development in the vicinity of a liquefied natural gas terminal site which is remote from human population concentrations shall be prohibited. At such time as liquefied natural gas marine terminal operations are found consistent with public safety, terminal sites only in developed or industrialized port areas may be approved." (California Public Resources Code, Section 30251 (b).)

WHEREAS, the reply brief states that the Oxnard site is preferred by California and, therefore implies that the site is "remote from human population concentrations" or that "... the risks inherent in liquefied natural gas terminal operations [have been] sufficiently identified and overcome and such terminals [have been] found to be consistent with the health and safety of nearby human populations...";

WHEREAS, the brief implies that more than one site will be permitted on the California coast, which further implies that "engineering and operational practices can eliminate any significant risk to life due to accident or [that] guaranteed supplies of liquefied natural gas and distribution system dependence on liquefied natural gas are substantial enough that an interruption of service from a single liquefied natural gas facility would cause substantial public harm."

Therefore, the California Coastal Zone Conservation Commission submits the following response to the CPUC's reply brief:

Recognizing the need for a state policy concerning LNG terminal siting, the Legislature and the Governor established such a policy in the California Coastal Act of 1976, and established the California Coastal Commission as the state agency directly responsible for implementing that siting policy. Thus, the State of California has moved expeditiously to establish a state-wide policy for LNG siting and to implement that policy. Moreover, that siting policy is an integral part of the coastal zone management program submitted by the State to the Department of Commerce for certification under the Federal Coastal Zone Management Act.

UNITED STATES OF AMERICA
BEFORE THE FEDERAL POWER COMMISSION

In the Matter of:)
El Paso Alaska Company, et al.) Docket Nos. CP75-96, et al.

STATEMENT OF POSITION ON BEHALF OF

SIERRA CLUB
THE WILDERNESS SOCIETY
NATIONAL AUDUBON SOCIETY
ALASKA CONSERVATION SOCIETY

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December 3, 1976

Attorneys for Conservation Intervenors

UNITED STATES OF AMERICA
BEFORE THE FEDERAL POWER COMMISSION

In the Matter of:

El Paso Alaska Company, et al.

)
) Docket Nos. CP75-96, et al.
)

STATEMENT OF POSITION ON BEHALF OF
SIERRA CLUB
THE WILDERNESS SOCIETY
NATIONAL AUDUBON SOCIETY
ALASKA CONSERVATION SOCIETY

The position of the Conservation Intervenors has been clear from the beginning of this proceeding, and was recently detailed in our Brief on Environmental Matters. The Conservation Intervenors believe that construction and operation of a pipeline across the Arctic National Wildlife Range, the last patch of Arctic Wilderness with any chance of preservation, is not in the long term public interest, and thus the Arctic Gas proposal should not, and indeed as a matter of law cannot, be licensed.

In addition, the Conservation Intervenors are convinced that a pipeline along the Alyeska pipeline corridor and other established utility rights of way and highways is the most rational method to accommodate development of North Slope energy resources with the preservation of some of the remaining truly wild sections of our nation's heritage.

In this respect either the Alcan or the El Paso projects would be vastly superior to the Arctic Gas system if their proposed environmental impact mitigation measures are fully implemented. The Alcan system causes some concern because of its length since it uses a western lateral, and because of its deviations from common utility corridors in some areas in Canada. ^{1/} But on the whole, as between the Alcan and El Paso systems, we believe that Alcan rates as superior to El Paso since it avoids problems of LNG safety, siting in California, and crossing the Chugach National Forest.

Our position, while importantly influenced by environmental

^{1/} Some of the deviations are justified on environmental grounds to avoid following an earlier corridor into sensitive habitat.

factors, is also based on our analysis of other major issues in this case -- cost, financability, likelihood of practical success of construction plan, timing of completion, etc. But because our analysis indicates that no system is clearly superior with respect to all these issues when taken together, we believe that environmental protection, and principally the integrity of the Arctic Wildlife Range, emerge as the pivotal issues upon which the case must ultimately be decided.

Each of the projects has considerable disadvantages, with the result that none is overwhelmingly superior to the others in terms of costs and engineering. For example, the construction advantages to El Paso of using the Alyeska pipeline route (if its realigned case is selected) are offset to some degree by the complications and fuel inefficiency of the LNG conversion process. Thus, although El Paso's pipeline is shortest and takes greatest advantage of Alyeska information, experience and facilities, its total system is complex and is the most expensive in terms of presently projected costs. 2 /

Similarly, the advantage of traversing generally flat terrain by Arctic Gas is outweighed by its strict, unforgiving construction schedule and the lack of ready access imposed by its winter construction plan. The latter is required because of the extreme sensitivity during the summer of the Arctic environment that would be bisected by the Arctic Gas pipeline. Thus the underpinning of Arctic Gas' whole project, upon which rest all its claimed advantages of costs, timely completion and environmental acceptability, is the successful implementation of winter construction and the use of a snow haul road. Snow roads have never been used as the principal material conduit for a project such as this, and Arctic Gas' test facility

2/ El Paso's capital cost estimate in 1975 dollars is \$6.57 billion for its 2.4 bcf/d case (Exhibits EP-200, 207, 228, 212, 265, WL-46); Alcan's estimate is \$6.28 billion (Exhibit AP-14); Arctic Gas' total capital cost estimate is \$8.05 billion, with \$6.20 billion of that allocated to the U.S. under the reasonable assumption of 1.0 bcf/d from the Mackenzie Delta. (Exhibit AA-73, as modified by AA-141).

was not subjected to sustained heavy traffic. 3/ Thus there is a substantial risk that the Arctic Gas project would not be completed within the time frame or cost estimate submitted here.

The Alcan pipeline would be somewhat longer than its competitors and would have a smaller ultimate capacity than Arctic Gas. However, Alcan would have the practical and economic advantages of a capability to scale up in capacity to accommodate the quantities of gas that actually become available. The recent evidence that Alcan's design would allow up to 2.9 bcf/d of gas flow on an average day 4/ would indicate that it could easily accommodate the reasonably foreseeable available supply from the North Slope. In addition, Alcan would have the advantage of the construction experience and access provided by previous pipeline and road work all along the line. This means that Alcan's cost and time requirements ~~can be more reliably estimated than either of the other two~~ projects.

In terms of cost, all of these projects would be immensely expensive, and costs for each will likely escalate so much that figures proffered by the Applicants now will prove to be meaningless. Certainly comparisons of cost of service are not realistic, since the apparent advantage for Arctic Gas today is dependent upon the success of an excessively risky construction scheme, and upon a gas supply projection that is unsupported at this time. 5/ The magnitude of the ranges of projected cost of service for each project, under various assumptions as submitted by all the Applicants, illustrates the futility of attempting to compare costs of these three projects. In fact the ranges of costs of service overlap each other. 6/ All these figures show is that depending upon what circumstances obtain when construction is finally undertaken, the costs of all three are likely to be greater

3/ Exhibit EP-236, p. 12; Dau, Tr. 23/3,427).

4/ Lange, Tr. 218/37, 98-01, 38,055, 38,063-64; Neuss, Tr. 219/38,200; Mirosh Tr. 222/38,813; Phillips, Tr. 241/42,162).

5/ Exhibit AA-71, cited by Arctic Gas for the cost figures contained in it's Initial Brief Relative to Economic Considerations, Nov. 19, 1976, p. 23a, is based upon Mackenzie Delta gas supplies of 2.25 bcf/d.

6/ Initial Brief of the Alcan Project On Economic Matters, Nov. 19, 1976, App. A, p. 1; Exhibits AA-71, 73, 80, 140, 141, AP-12, 14, 19, EP-265.

than expected. And since each system is fundamentally different, inflation and technical difficulties may affect each in different ways. Thus all figures submitted to the record here must be recognized as guesswork and nothing more. Any claim to a cost advantage by any Applicant here is simply mythical.

Arctic Gas has the advantage of traversing terrain of lower seismic risk than Alcan or El Paso, but the disadvantage of attempting to invade the heart of the Northwest Territories before progress has been made in Canada's settlement of Native claims in the region. While the former problem can be designed for, the latter may require the project simply to wait until the claims are settled.

~~Thus there are no clear substantial advantages to any of the three projects when costs, engineering and construction method are weighed together. The longest route, Alcan, would be the most straight-forward to construct; the shortest, El Paso, involves the most technical complexity; and the Arctic Gas route is riskiest overall, though the terrain is gentlest.~~

As to financing, an acceptable financing plan can, and inevitably will, be fashioned irrespective of which system is chosen, although Arctic Gas and Alcan may have somewhat more difficulties due to their Canadian financial requirements. Alcan can probably be on line in less time than either El Paso or Arctic Gas. And while its design is not complete and many environmental studies must still be done, this is the case to some degree with the other projects as well. 7/ Both Alcan and El Paso will produce more positive and less negative socio-economic effects than Arctic Gas, particularly in the State of Alaska. 8/

All of these factors, plus a reasonable guess as to the amount of gas likely to become available, must be weighed by the decision-makers

7/ Arctic Gas has substantial drilling and design work left on many of its river crossings on the North Slope, and on a 30 mile section of the route where no drilling has yet taken place. (Clark, Tr. 19/2, 969, 2, 974; Cooper, 20/3, 204, 3196-99; Clark, Tr. 154/25, 445). El Paso has not yet chosen its route alignment, and thus site specific fish and wildlife studies are yet to be conducted.

8/ See Brief of the State of Alaska on Socio-Economic Matters, Nov. 23, 1976.

here. Trade-offs must be made among certainty of completion, the risk of unexpected delays and costs, efficiency of transportation to a wide range of lower 48 markets, and international politics. In this process of decision-making one thing is clear. Only the Arctic Gas project threatens a magnificent wilderness with a gas pipeline and the probability of additional oil and gas development. Neither of the other two projects forces a present decision to destroy the precious dwindling resource of Arctic wilderness. Since Arctic Gas has no overwhelming advantage of cost, timing and construction, the long term public interest demands that the unique world asset that is the Arctic National Wildlife Range be preserved.

Respectfully submitted,

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Before the
Federal Power Commission

El Paso Alaska Company, et al.) Docket No. CP75-96, et al.

POSITION BRIEF OF
THE COMMISSION STAFF

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Washington, D. C.
December 7, 1976

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Appendix A

Appendix B

El Paso Alaska Company, et al.) Docket No. CP75-96, et al.

--- POSITION BRIEF OF
THE COMMISSION STAFF

I. INTRODUCTION AND STATEMENT OF POSITION

The enormous record in this case ^{1/} coupled with the need for expedition to meet the spirit and letter of the Alaska Natural Gas Transportation Act of 1976 (Public Law 94-586) necessitated the adoption of a segmented individual issue by issue briefing schedule. This process has been under way since early 1976 and is due to conclude with the filing of Wrap-Up briefs on December 15, 1976. Appendix A lists the series of briefs filed by Staff starting on May 28, 1976. This brief states the position of the Commission Staff on the overall question of which of the three competitive projects is superior. It is not intended to be a summary of the series of briefs filed previously by Staff because some issue areas are common to all three proposals, and the conclusions we reach in these specific issue areas do not for the most part favor one applicant over another. In the interest of a concise statement of the Staff position in this case, we have attempted to distill our thinking on this very complex case into the shortest document possible. The arguments and project comparisons which are presented in Section IV cover, in our opinion, the key issues in the case, but the list of issues contained therein is by no means exhaustive. The specific issue areas in the project comparisons are presented in the order of significance as we perceive them, in terms of their relative weight in deciding the superiority of one project over another. This does not mean that issue areas lower in the list are not significant in this case in and of themselves, quite the contrary; rather, in our opinion such areas are relatively less significant in deciding between the projects. For example the area of tariffs is of enormous significance to Staff but is of little moment in determining which of the three projects is superior.

For a full statement of our arguments, conclusions, and positions on specific issue areas, reference should be made to individual Staff briefs and the Staff final environmental impact statement (FEIS). Section IV (2) of this brief constitutes Staff's economics brief.

^{1/} 44,584 pages of transcript in 253 volumes (days) together with countless exhibits.

Based upon the analysis that follows and our overall experience in participating in the preparations for and conduct of the hearing in this case, the Staff has reached a position on which of the three projects 2/ best serves the public convenience and necessity.

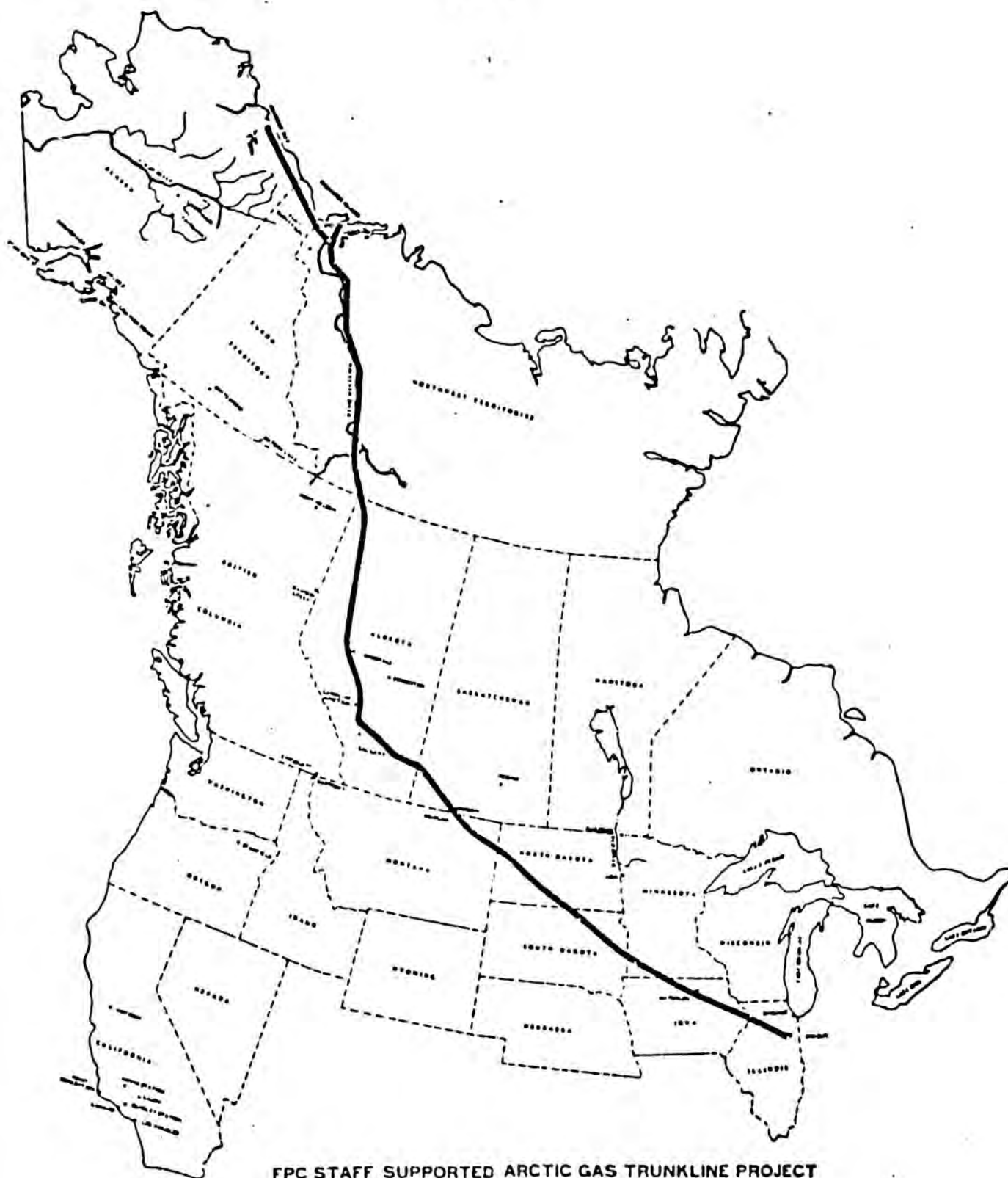
Staff supports the Arctic Gas project modified and improved by the elimination of the "western leg" lateral to California, which has been shown on this record to be high risk, uneconomic, unnecessary, and environmentally unsound. The modified Arctic Gas project supported by Staff, shown in Figure No. 1, is a trunkline which would provide equitable access to Prudhoe Bay gas for all regions of the nation. Shorn of the unnecessary \$700 million California lateral 3/, the recommended Arctic Gas project consists of a 48-inch and 42-inch diameter high pressure natural gas system that can deliver Mackenzie Delta gas to the Trans-Canada pipeline system for transmission throughout Canada, and at the same time can deliver Prudhoe Bay gas to central locations in the United States, from which it can be delivered to all existing continental markets. In our opinion, the only Arctic Gas trunkline transmission facility that can be certificated at this time excludes the western leg. Particularly significant in this opinion is the fact that only 12-1/2% of the Prudhoe Bay gas has as of this time been placed under contract. 4/ If the Prudhoe Bay gas is purchased by transmission and distribution companies spread throughout the continental 48 states, as has been assumed on the record and as we think is highly probable, this modified Arctic Gas trunkline in conjunction with the existing interstate natural gas pipeline network will be all that is required to move Prudhoe Bay gas to distributors and ultimately to the consumers of this gas. If particular purchasing companies in specific regions of the nation contract for more or less gas than has nominally been assumed in this record, then the certification of anything more than the modified Arctic Gas trunkline could turn out to have been a costly mistake. We believe the certification of this Arctic Gas system, modified by the elimination of the California lateral, is prudent, reasonable, and in the public interest, conditioned upon subsequent evidence of gas purchase contracts and financing.

2/ Arctic Gas project, El Paso Alaska project, Alcan project

3/ The original Arctic Gas project was amended to reflect the deletion of a \$300 million eastern extension from the Chicago area to near Pittsburgh and by the requested withdrawal of Interstate Transmission Associates proposal for a second western leg to Los Angeles.

4/ By the State of Alaska whose royalty gas contracts do not contain price provisions and are subject to legislative approval in the future.

Figure 1



FPC STAFF SUPPORTED ARCTIC GAS TRUNKLINE PROJECT

II. BRIEF DESCRIPTION OF COMPETING PROJECTS

(1) Alaskan Arctic Gas Pipeline Company, et al. (Arctic Gas) 5/

The Alaskan Arctic project (Figure 2) involves the construction of 3,486 miles of 48-, 42-, 36- and 30-inch diameter pipeline. 6/ Under this proposal a 48-inch diameter pipeline will be constructed from Prudhoe Bay, Alaska, east to the Mackenzie Delta in the Northwest Territories of Canada. From the Delta a 48-inch diameter pipeline will be constructed through Caroline, Alberta, to Empress, Alberta. At Empress the facilities will intertie with those of Trans-Canada Pipelines Limited and a new 42-inch diameter pipeline to the U.S. border at Monchy, Saskatchewan. A new 30-inch pipeline will be constructed from Caroline to the Alberta-British Columbia border at Coleman, Alberta. From Coleman, Alberta, the existing facilities of Alberta Natural, PGT, and PG&E, as far south as an intertie with the Southern California Gas Company (SoCal) system at Hinkley Station in California, will be expanded with a total 36-inch diameter pipeline loop. A new 42-inch diameter pipeline will be constructed from the border at Monchy to Dwight, Illinois. This system is designed to transport 2.25 Bcf/d of Prudhoe Bay gas to U.S. markets and 2.25 Bcf/d of Mackenzie Delta gas to Canadian markets. As proposed, 1,530 MMcf/d of Alaskan gas will be delivered to Northern Border at Monchy for delivery to markets in the Midwest and East; the remaining 659 MMcf/d will be transported through the western leg for delivery to Northwest Pipeline Company (22 MMcf/d), PG&E (200 MMcf/d), and SoCal (437 MMcf/d).

(2) El Paso Alaska Company, et al. (El Paso) 7/

As proposed, El Paso (Figure 3) will construct an 809-mile 42-inch diameter pipeline from Prudhoe Bay, following the Alyeska oil pipeline corridor, to an eight-train LNG liquefaction facility and terminal at Point Gravina on the south coast of Alaska. A

5/ Includes the transmission facilities proposed by Canadian Arctic Gas Pipeline Limited, Alberta Natural Gas Company Limited (Alberta Natural), Pacific Gas Transmission Company (PGT), Pacific Gas and Electric Company (PG&E), and Northern Border Pipeline Company (Northern Border).

6/ Only 1,903.9 miles are actually involved in applications before this Commission; the remaining are within the jurisdiction of Canada (2,281 miles) and the State of California (418 miles).

7/ Includes the facilities of Western LNG Terminal Company (Western LNG).

fleet of eleven, 165,000 cubic meter cryogenic tankers will be built to transport the LNG 1,900 nautical miles to Point Conception, California. Terminal, regasification facilities, and 251 miles of 42-inch diameter pipeline from Point Conception to Cajon, California, will be constructed by Western LNG. These facilities have been designed on the basis of the delivery of a nominal 3.2 Bcf/d to the liquefaction plant.

El Paso has made alternate showings which describe the facilities predicated on the deliver of 2.4 Bcf/d to the liquefaction plant and realignment of the Alaska pipeline closer to the Alyeska pipeline. The 2.4 Bcf/d case involves essentially the same pipeline with less compression, a six-train liquefaction plant, and the use of eight cryogenic tankers. El Paso maintains that it is ready, willing, and able to build any of the three alternatives (Applications Brief, page 9). Western LNG has also provided showings that correspond to the 2.4 Bcf/d case.

(3) Alcan Pipeline Company, et al. (Alcan) 8/

Alcan (Figure 4) proposes the construction of 1,800 miles of new pipeline in Alaska and Canada and the expansion of existing facilities in the provinces of Alberta and British Columbia and the States of Oregon and Washington. A 42-inch diameter pipeline will be constructed from Prudhoe Bay to Fort Nelson, British Columbia. The route will follow the Alyeska oil pipeline as far as Delta Junction, Alaska, from there the Alcan Highway through the Yukon Territory to Fort Nelson where it will connect with the existing facilities of Westcoast. A 36-inch diameter pipeline will be built from Fort Nelson to a point of interconnection with the facilities of AGTL near Lake Zama, Alberta. The Westcoast facilities will be expanded through the addition of 201 miles of 36-inch diameter pipeline looping, and the AGTL facilities will be expanded by the use of an unknown amount of 42-inch diameter pipeline looping. A 30-inch diameter pipeline

8/ Includes Northwest Pipeline Corporation (Northwest), Foothills Pipe Lines (Yukon) Ltd. (Foothills), Westcoast Transmission Company Limited (Westcoast), the Alberta Gas Trunk Line Limited, and the Alberta Gas Trunk Line (Canada) Limited (AGTL). Only the facilities of Alcan and Northwest are within the U.S. and subject to this Commission's jurisdiction.

looping of 359 miles will be constructed by Northwest on its existing system between Sumas, Washington and a proposed new intertie with PGT at Kent, Oregon. A new 36-inch diameter pipeline will also be constructed in Saskatchewan connecting the existing AGTL facilities at Empress, Alberta, with the Northern Border facilities at Monchy. The Alcan project envisions the construction by Northern Border of a 36-inch diameter pipeline along its currently proposed route and the expansion of the existing PGT and PG&E facilities south of Kent, Oregon.

As will be discussed in other sections of this brief, Staff believes the Maple Leaf project must also be considered with Alcan; therefore, this project is included in Figure 4 and described as follows. The Maple Leaf project is a system for the delivery of Mackenzie Delta gas to Canadian markets sponsored by Foothills, Westcoast, and AGTL. The Maple Leaf group proposes to construct 898 miles of 42-inch diameter pipeline from the Mackenzie Delta to the existing AGTL system and 155 miles of 30-inch diameter pipeline laterals connecting this facility with Parsons Lake and the existing facilities of Westcoast. The existing facilities of AGTL and Westcoast will also be expanded to transport the 800 MMcf/d to 2,400 MMcf/d anticipated from the Mackenzie Delta.

III.

BASIS FOR COMPARISON

The Arctic Gas project was filed with this Commission and the Canadian National Energy Board (NEB) on March 21, 1974. The initial filing with the Commission was deficient in many significant ways. This fact was not disputed by the applicants. They themselves highlighted some of the omissions and explained the rationale behind their filing schedule.

The El Paso Alaska project was filed with the Commission on September 24, 1974. The El Paso Alaska filing also lacked significant required information.

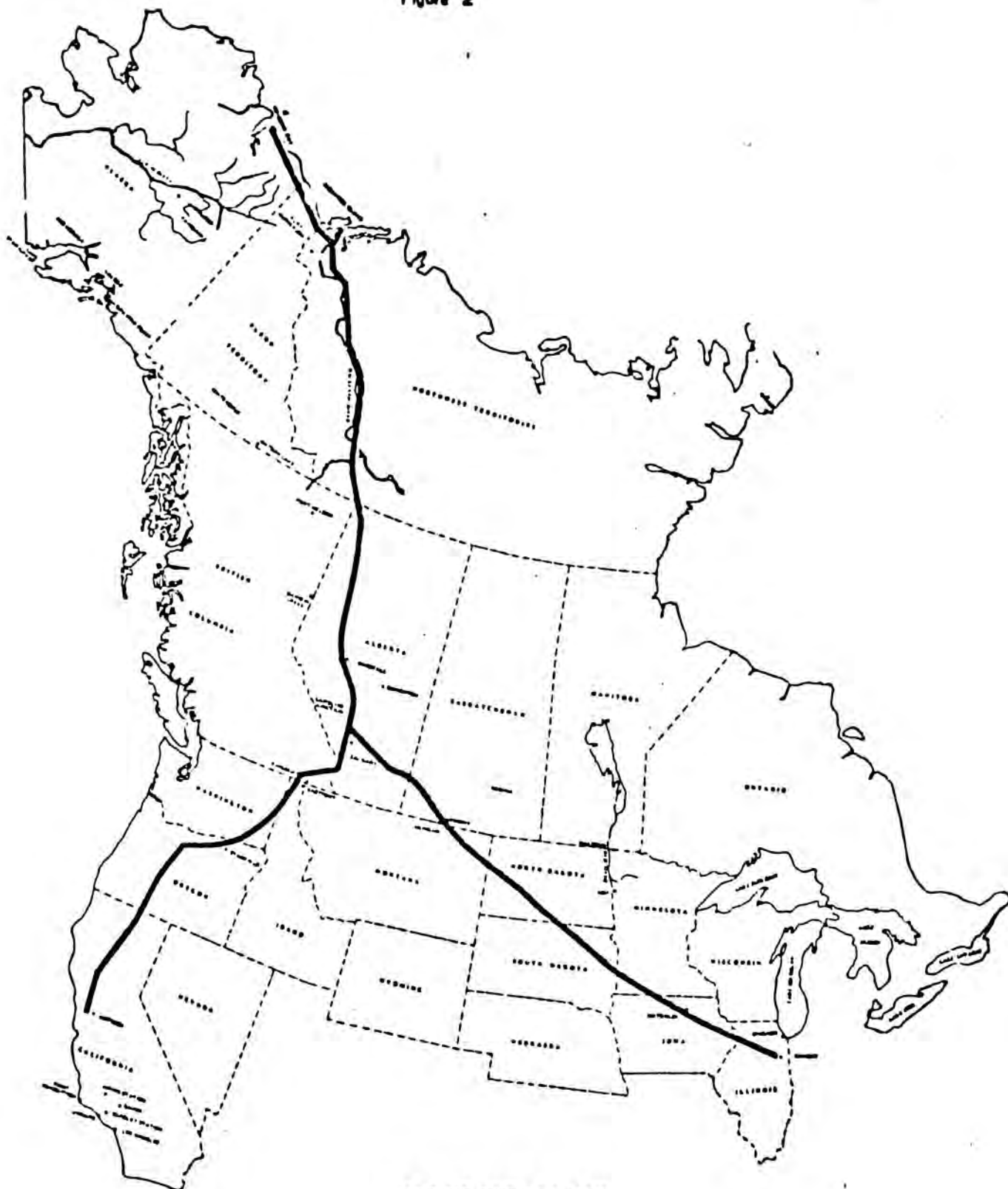
The two above filings went through a long and laborious process of refinement resulting in very tightly reasoned, highly defensible presentations which included the testimony, exhibits, backup studies, and supporting workpapers of the expert witnesses presented.

The Alcan project was filed on July 9, 1976, after a massive and impressive effort on the part of its sponsoring Canadian and U.S. companies. The process of perfecting the Alcan project was carried out in a much shorter time period than the other two projects. As a result, the degree of certainty that can

be attached to the cost projections associated with the Alcan project is significantly less than for the other two projects, in our opinion. By the same token, the minor adjustments and improvements that occurred during the hearing process did not run to full completion. On balance, though, Staff believes that the Alcan project was fairly presented and adequately reviewed. The enormous problems the Staff has with the Alcan project stem from the fundamental concepts underlying the project, not how or to what degree it was presented on the record. We are of the opinion that another year of hearing on the Alcan project, as filed, would add very little evidence that would be of value in deciding for or against Alcan. This is not to say that we cannot see many ways in which we would modify the Alcan project.

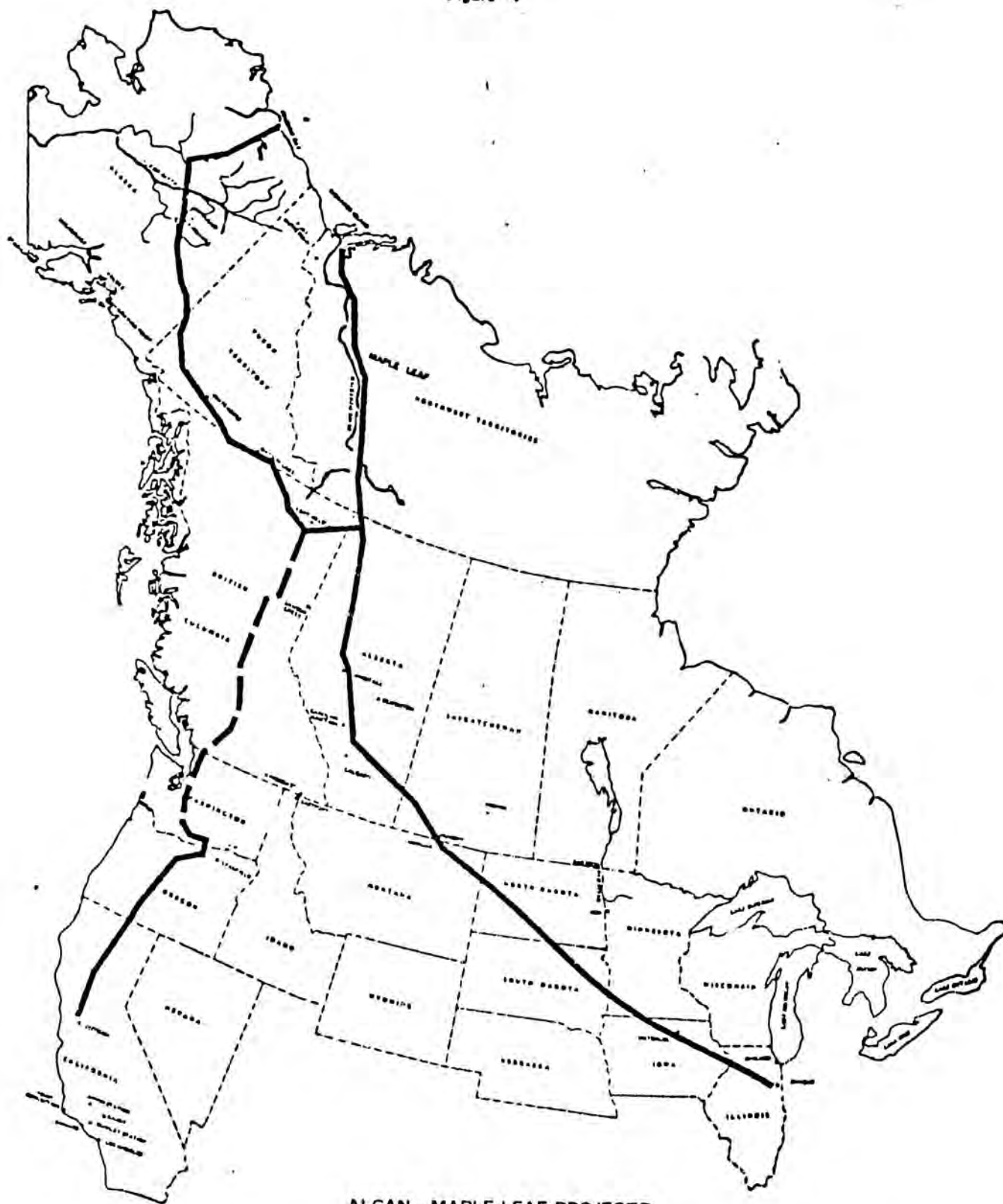
The Staff approach throughout the proceeding has been to modify the El Paso Alaska and Arctic Gas projects and to then compare them. In considering the Alcan filing in terms of Staff-supported testimony modifying and improving the filed proposal, we came to an interesting conclusion. The modified Alcan project we ended up with was in essence the Arctic Gas project. Our reasoning was essentially this. If you have approximately 3.25 Bcf/d of gas to transport, you do not incrementally expand two existing low-pressure transmission systems that are, for all intents and purposes, full. You take advantage of the economies of scale and build the largest diameter new facility that can be justified. Secondly, if the Maple Leaf project is assumed, and the Alcan project sponsors so assume, conventional natural gas industry logic suggests that one should look at a 400-mile leg to bring Prudhoe Bay gas east to the Delta and then expand the Maple Leaf line to 48-inch diameter. These changes to the Alcan and Maple Leaf projects would result in basically an Arctic Gas project.

Figure 2



ARCTIC GAS PROJECT

Figure 4



ALCAN - MAPLE LEAF PROJECTS

IV.

PROJECT COMPARISONS

(1) Overall Project Conception 9/

The three competitive projects in this case present significantly different approaches to the problem of delivering North Slope Alaska natural gas production to market in the lower 48 states. The fundamental underlying conceptual structure of each of the three projects is highly significant: in our opinion, the selection of the preferred project turns upon this decisive factor. This is the case because the key determinants in choosing between the alternative projects, such as economy, environment, engineering etc., all of which we consider in detail below, are to a large degree predetermined by the initial choices made in the formulation of each project.

(A) The Arctic Gas Project

Even a casual view of a topographic map of North America will reveal that the sponsors of the Arctic Gas project have chosen the most logical natural gas pipeline route from Prudhoe Bay across western Canada to the central United States. This is a physical fact. When the existence of a natural gas field in the Canadian Mackenzie Delta region is given recognition, the choice of the Arctic Gas route becomes overwhelming in its appeal. A natural corridor exists along the Beaufort Sea to the Delta and then south along the Mackenzie River Valley to Alberta. The mountains are, for the most part, skirted. Across Alberta the route follows existing natural gas lines to Empress, then strikes an essentially straight line for the midwestern region of the United States. In the process, two major existing natural gas trunklines serving western, central, and eastern Canada are crossed, three major pipelines in the United States are intersected and the major north-south transmission facility serving the region of the United States west of the Rocky Mountains is crossed. The fundamental logic of the Arctic Gas route is unassailable. If the realities of territorial sovereignty and the geography of wildlife preservation had been different, to the point of falling out of the decisional equation, there would have been no alternative proposals, period!

9/ The arguments presented here are based upon evidence that is woven throughout the entire 44,584 pages of transcript in this case. Staff's subject area briefs (see Appendix A) and those of other parties give ample record citations for particular points.

The choice of an all-land pipeline brings with it the benefits of over thirty years of natural gas pipeline technology. The Arctic Gas project 48-inch diameter 1680-psig proposal is a consistent next step in the evolution of high pressure natural gas pipeline design, if history is any guide. There will be problems; there are significant uncertainties; but the alternative is dramatically higher transmission costs. The risks are prudent and should be taken, in our opinion.

The combination of the Mackenzie Delta Field reserves in Canada with the Prudhoe Bay Field reserves in Alaska, as a foundation of supply for a joint project which takes full advantage of the economies of scale, minimizes the risks which are inherent in connecting these supplies. ^{10/} The effects of the uncertainties of gas reserve and deliverability projections are reduced by a joint project. Should the dictates of maximum oil recovery from the Prudhoe Bay oil field result in natural gas deliveries lower than the producer-projected minimum of 2.0 Bcf/d, there remains the very real chance that the Mackenzie Delta Field will out perform the assumed initial 1.0 Bcf/d projected by the Arctic Gas and Alcan sponsors. If the Delta Field does not come on as fast and to the degree projected, there is the possibility that Prudhoe Bay oil lifting will allow gas deliveries greater than the initial high-side 2.5 Bcf/d estimated by the field owners. The significance of this advantage to the Arctic Gas project is pervasive. The effects of it touch upon many key issue areas; neither of the other two competitive projects has this advantage.

The reliability of land pipelines is well documented. The natural gas network that spans the nation has been an unqualified success. Our standard of living is due in large part to this low cost, efficient, and reliable energy delivery system. The basic technology, upon which the Arctic Gas project is predicted, is elemental, low level, and highly reliable.

The direct route chosen by the Arctic sponsors together with the connection of two major reserve pools in one project, allows capital cost levels, transmission fuel requirements and construction material requirements that approach the physical minimums associated with the movement of natural gas. These are advantages and combinations of advantages that are formidable, and the superiority of the Arctic Gas project which we discuss below under specific topic heads largely flows from these central considerations.

^{10/} The resulting route also traverses the most promising potential gas reserve areas on the Arctic coast of the U.S. and western Canada.

(B) The El Paso Alaska LNG Project

The concept underlying and delimiting the El Paso Alaska project is that Prudhoe Bay gas should be delivered to the lower 48 states in such a manner that exclusive United States jurisdiction is maintained. Stated another way, the assumption--implicit or explicit--is that transit of Alaska gas across Canada is precluded or at very least unwise. This cardinal principle of the El Paso project is its paramount strength or its critical weakness, depending upon how the Canadian government decides its best interests will be served.

Viewed in the context of economics, engineering, environment, the history of the industry, etc.--in short in any way other than international politics--the El Paso project suffers significantly as a result of the physical realities of the circuitous route it must follow in order to stay within United States controlled areas. A water route is dictated, and this in turn necessitates the conversion of the transit Alaska gas into and out of the liquid state. At each step, costs in the broadest sense are necessarily incurred.

Water transit involves complex ships of a size not yet in existence. Ship movement introduces a line of discontinuous storage batch movement of gas between beginning and end links of continuous flow pipeline in the chain from gas field to market. The change in state required entails significant energy costs which can only be recovered under ideal conditions. The overall fuel requirements associated with land-water-land movement of natural gas are substantially greater than those associated with conventional land movement.

The liquefaction facility in Alaska and the corresponding regasification receiving terminal in California, in conjunction with the operation of ships, result in higher annual operating costs throughout the life of the project and introduce a risk of service interruptions. To a large degree, these types of costs are difficult to reduce and are prone to escalation due to inflation.

The required water route results in the significant environmental impact disadvantage associated with the El Paso Alaska project. The thermal pollution problems, the safety questions raised by LNG terminals and ships, the facility reliability uncertainty, and the passage through high-risk seismic activity areas in Alaska and California all result from the route selection dictated by the El Paso Alaska project concept.

The El Paso Alaska route extends 800 miles due south from Prudhoe Bay in a direction that points as much toward Honolulu as it does to San Francisco, let alone Chicago. The primary direction from Prudhoe Bay to the major market regions of the nation is southeast. As a result, the El Paso Alaska project lays the North Slope gas down on the California coast at one edge of the national natural gas market. An imaginative and innovative, but less than ideal, reverse flow proposal on the existing east-west El Paso Natural Pipeline is required to move North Slope gas to mid-continent points where it can be delivered throughout the nation.

Finally, by avoiding Canada, the El Paso Alaska route gives up the economic and risk reduction advantages of combining the Mackenzie Delta reserves with Prudhoe Bay reserves.

(C) The Alcan Project and the Maple Leaf Project

The underlying principles of the Alcan project appear to be as follows: (1) Prudhoe Bay gas should transit Alaska to Fairbanks and then follow the Alcan Highway to Fort Nelson; (2) the two existing western Canadian north-south transmission systems should be incrementally expanded to move Alaskan gas commingled with existing Canadian traditional production area gas; (3) an arbitrary 30%-70% split of Prudhoe Bay gas should occur at Fort Nelson; (4) 30% of the Alaskan gas should go south in the Westcoast Pipeline system, and 70% should go east to Zama Lake and then south in the Alberta Trunk system; (5) a design pressure of 1250 psig should be used on all new portions of the Alcan system; (6) no pipeline greater than 42-inch diameter should be utilized even if it is economically justified; (7) no co-ordinated corporate entity or Canadian and-U.S.-related entities should be created to construct the Alcan project; (8) the sequence of corporate entities which would build, own, and operate the Alcan system would basically follow state and provincial boundaries with individual corporations for each political subdivision down to the U.S. border; and (9) Prudhoe Bay gas should be brought on stream in the following sequence; 1.2 Bcf/d in year one, 1.6 Bcf/d in year two, and 2.4 Bcf/d in year three of the project.

The underlying principles of the Maple Leaf project appear to be as follows: (1) Mackenzie Delta gas should be brought on stream approximately 18 months after Prudhoe Bay gas begins to flow in the Alcan project, (2) the Mackenzie Delta gas should be commingled with existing Canadian traditional production area gas and with Prudhoe Bay gas south of Fort Nelson and Zama Lake; and (3) Mackenzie Delta gas will be rolled-in with the existing Canadian gas stream for transportation rate purposes.

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The same two corporations sponsor the Alcan and Maple Leaf projects within Canada. These corporations, Westcoast Transmission Company and Alberta Gas Trunk Line Company, have indicated that their first objective is to build the Maple Leaf project, but that the Alcan project can be built first and the Maple Leaf project deferred into the late 1980's or longer if the Canadian Government chooses to do so.

The separability of the Alcan and Maple Leaf projects presents problems for any decision maker in comparing the Alcan project with the Arctic Gas project. The Arctic Gas project is predicated upon combining the Prudhoe Bay gas with the Mackenzie Delta gas to achieve significant economies, as we have discussed above. Comparing the Arctic Gas project, which connects the Mackenzie Delta reserves, with the Alcan project which does not, present problems that are not involved in the comparison of the Arctic Gas project, with the El Paso Alaska project. This is true even though the El Paso Alaska project does not connect the Delta reserves either. The Arctic Gas and the Alcan projects are international in scope. The needs and best interests of two nations must by law be considered. In the case of the U.S. go-it-alone El Paso Alaska project or the Canadian go it alone Maple Leaf project, there are impacts upon each nation as a result of the other nation selecting its unilateral project, but these effects are indirect and do not require that either government necessarily take the other governments' interests into consideration.

For our purposes Staff believes that from a logical, from a practical and from a legal point of view we must combine the Alcan and the Maple Leaf projects in attempting to select the superior route of the three applications before us. The two projects are on file in Canada before the National Energy Board, they have been consolidated and are being heard together. The Arctic Gas project connects the two reserve pools. The only logical approach we can see, is to look at what options the Alcan project leaves for Canada to connect Delta Gas and to compare the economic, engineering, financing etc. consequences of doing this with the Arctic Gas project. From a practical point of view there is no basis on this record for determining what the Alcan project would look like in detail, the detail required by the rules and regulations, if the Maple Leaf project were assumed to be delayed or never built. Staff defies anyone to segregate out the specific facilities, the specific costs associated with those facilities and point to the specific flow diagrams that would be associated with the Alberta Trunk portion of the Alcan project standing alone. Staff can not do it, Arctic

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Gas could not do it and more importantly the Alcan sponsored witnesses for Alberta Trunk could not do it on the stand. This situation obtains for Westcoast and for Northwest Pipeline to a lesser degree. Northwest's facilities presentation is predicated upon the resumption of deliveries at Sumas in 1983, which according to testimony put on by Westcoast is predicated upon the Maple Leaf project being on stream by 1983. The Alcan project was presented for this record on the basis that the Maple Leaf project would track along 18 months later. The detailed subject area by subject area presentations are so intertwined, interconnected, and co-ordinated that at very best only a generalized Alcan project can be envisioned, absent any Maple Leaf project at all.

Based upon the above considerations we treat the Alcan project and the Maple Leaf project as one system in comparing it with the Arctic Gas and El Paso Alaska projects.

No. The Alcan and Maple Leaf system combines the Prudhoe Bay and Mackenzie Delta reserves in an enormously inefficient way. Approximately 1200 more miles of pipeline would be required to bring these two streams of gas together in northwestern Alberta, than in the Arctic Gas project. South of this junction point in Alberta the 30%-70% split of Alaska gas is arbitrary and appears to have been dictated by considerations other than economics. Alcan's own cost exhibits show that the use of the Westcoast system is significantly more expensive than the Alberta Trunk system would be. In similar fashion routing the California gas through the Northwest pipeline in Oregon and Washington is more expensive than using the existing or new Pacific Gas Transmission system. These curious facts are readily apparent and basically uncontested. Alcan even proposed a tariff arrangement to average out the transmission costs of their split stream approach, in order to avoid the obvious discrimination between shippers.

No meaningful express line studies across Alberta were conducted by either company or by any participant in the Alcan and Maple Leaf projects. Subsequent to the filing of applications for the total Alcan and Maple Leaf system, Staff requested that a 42-inch diameter line from Sousa to Empress be analyzed and the results supplied for the record. The response from the Alcan and Maple Leaf sponsors was succinct and revealing "these

questions require us to analyze new designs which we have not proposed and have not sought authorization to construct" (Tr. 44,381).

The ultra-conservative engineering approach assume by the Alcan and Maple Leaf system sponsors in respect to maximum line pressure on new pipeline, leads necessarily to an uneconomic system. The filed for 1250 psig initial maximum design pressure with a very tentative future escalation to 1440 psig with experience, became as the hearing progressed the 1440 psig design derated in early years to 1250 psig. The Alcan and Maple Leaf witnesses final word appears to be - 1680 psig systems as proposed by El Paso Alaska and Arctic Gas are probably feasible in the future, but are too speculative for use at this time. *

The 2.4 Bcf/d ceiling on transit United States gas in the Alcan and Maple Leaf system was at first a cardinal principle underlying the fundamental concept of the project. The passage of time left this critical consideration in a kind of limbo. The policy witnesses attempted to explain the simple and clear contractual language away near the close of the record (witness Blair Tr. 41,868 to 41,896). The most revealing fact is that there is no basis in the record in this case to do anything other than speculate what it would cost to transport Prudhoe Bay volumes in excess of 2.4 Bcf/d in the Alcan and Maple Leaf system. *

The above cited conceptual design considerations underlying the Alcan and Maple Leaf system virtually guarantee that any careful issue by issue comparison with the vastly superior Arctic Gas project will rebound to Alcan's disfavor. This is the overwhelming result of our analysis. *

(2) Economics

The applicants have marshalled an imposing array of expert cost witnesses who have not only designed, developed, and presented the proposed projects but have also evaluated and criticized the proposals of the competition. Staff has not independently costed out the three systems proposed. This is entirely beyond our means. Fortunately the process of a contested administrative hearing with three competitive applicants has provided a detailed fully cross-examined record in the area of overall economics. Staff believes this record is excellent in respect to capital costs and unit cost of transportation, and we basically rely upon it in what follows.

The projects presented here do not involve traditional design or construction techniques. In the case of the El Paso Alaska proposal, only 16 percent of the estimated capital cost 11/ could be considered as even approaching traditional-type facilities. Approximately 53 percent of Arctic Gas' estimated cost involves construction north of existing Canadian facilities. 12/ The Alcan, Foothills, and Westcoast facilities necessary to deliver Prudhoe Bay gas into the existing systems represents approximately 60 percent of the total costs of all the facilities envisioned for this project (Exhibit AP-14).

We believe that the propensity for cost overruns increases the further north the construction. Staff considers that the Arctic Gas construction south of Lake Zama involves traditional techniques and costs, and thus any overrun that may occur would in all likelihood be a result of general economic pressures within the U.S. and Canada. Although we are highly skeptical of the costs shown for the expansions on the Westcoast and Alberta Gas Trunkline systems, primarily because the applicants failed to provide conclusive cost allocation information, the cost overruns on the Alcan and Maple Leaf systems south of Fort Nelson and Lake Zama would also fit in the general economic category.

11/ Total cost less the Alaska Pipeline, LNG plant, and tankers (EP-174, 178, 182, 185, 265 and WL-46).

12/ The cost of facilities from Prudhoe Bay to Sousa (AA-139) as a percentage of total cost (AA-71).

Because of a heavier reliance on new techniques and on an unconventional type of transportation mode, it appears that the El Paso project would be much more susceptible to inordinate cost overruns than the other proposals. Unlike the other proposals, El Paso's more southerly transportation mode is the much less traditional cryogenic tanker fleet. Furthermore, the design of both the LNG plant and tankers involves a technological advance, though probably sound, that may subject the project to a greater degree of possible overrun. As noted earlier, only approximately 16 percent of the El Paso project could be considered as traditional construction. Although this type of analysis is subjective and difficult to quantify, it must still be one of the major considerations in determining the best of several proposals.

It is Staff's view as expressed above that the Arctic Gas project is conceptually the best project in that it is the shortest route for the delivery of Alaskan gas into the major area of the lower 48 states, as well as being the most fuel efficient in that it provides the cheapest method of delivering U.S. gas to U.S. consumers and Canadian gas to Canadian consumers. Therefore, in analyzing the economics of the three proposals we will prepare the El Paso project and the Alcan and Maple Leaf projects with Arctic Gas.

Arctic Gas indicated that its proposal for the delivery of 4.2 Bcf/d will cost an estimated \$8.6 billion, of which \$2.75 billion will be attributable to the transportation of Canadian Gas, (Exhibit AA-71, as adjusted by Dau, Tr. 233/40,531). 13/ The average fifth year transportation cost as calculated by Arctic Gas is \$1.238 per MMBtu (Exhibit AA-141). The facilities required for the delivery of 3.25 Bcf/d (no expansion case) are estimated to cost \$7.95 billion, of which \$1.82 billion is attributable to Canadian gas (Exhibit AA-73, as adjusted by Dau, Tr. 233/40,531). The average fifth year transportation cost for this no expansion facility is \$1.392 per MMBtu.

13/ All of the capital costs shown herein were based on July 1975, estimates. This is basically true of the entire record. To the extent inflation occurs, all of the cost figures will escalate.

As the result of an analysis of the Arctic Gas project done by Green Construction Company for El Paso (Exhibit EP-255), the answering testimony presented by El Paso contended that there would be a delay of more than two years in the completion of the Arctic Gas project. As a consequence of this delay, the cost overrun was estimated at 42 percent for the 3.5 Bcf/d case and 44 percent for the 2.5 Bcf/d case (Argetsinger, Tr. 183/30,745). Accordingly, El Paso recalculated the incremental delivery cost per MMBtu for Arctic Gas as follows: (Jack, Tr. 189/32,232 and Exhibit EP-259).

	3.5 Bcf/d Case	2.5 Bcf/d Case
West	\$1.653	\$1.922
Midwest	\$1.753	\$2.151
East	\$1.820	\$2.227

The total estimated capital cost shown by El Paso for its base case (3.2 Bcf/d) is \$7.92 billion ^{14/}; with \$6.57 billion being the estimate for the lower volume 2.4 Bcf/d case. ^{15/} The incremental delivery cost per MMBtu shown by El Paso for each case is as follows: (EP-265)

	3.1 Bcf/d	2.4 Bcf/d
West	\$1.476	\$1.610
Midwest	\$1.759	\$1.950
East	\$1.807	\$1.998
Average	\$1.669	\$1.836

The comparisons herein are based upon the cost of the proposed El Paso pipeline route, not its realignment case, which would add \$200 million to its base case. These increased costs are primarily due to the need for thicker walled pipe, as required by U.S. regulations when situated in close proximity to the Alyeska haul road, and increased gravel needs (Wright, Tr. 169/27,698-710). When balancing these increased costs and other geotechnical problems against the environmental benefits of this alternative, Staff believes the prime alignment is the better of the El Paso options.

^{14/} Sum of the costs shown in Exhibits EP-174, 178, 182, 185, 265 and WL-35.

^{15/} Sum of the costs shown in Exhibits EP-200, 207, 228, 212, 265 and WL-46.

Arctic Gas responded with testimony indicating that the facility capital cost estimates should be approximately 12.6 percent greater than those shown by El Paso. This projected cost increase was shown as being in the major areas of Alaskan pipeline construction, LNG plant facilities, and ship construction (J.T. Mitchell Tr. 168/27,645-62, Martino Tr. 156/25,802-7 and DeLeon Tr. 156/25,848-56). Witness R.G. Anderson (Tr. 162/26,696-713) illustrated that the transportation cost under the 3.2 Bcf/d case, which reflected the adjusted capital costs and fuel use at \$1.00 per MMBtu for the first full year of operation, ranged from \$1.84 per MMBtu for deliveries to PG&E and \$2.41 per MMBtu for deliveries to the Northern Border group (Exhibit AA-79).

In our opinion, Arctic Gas successfully rebutted the arguments of Green Construction except for the possibility that some cost overruns might occur because of a late start-up and early closing date for winter construction in the Arctic regions. This occurrence, which would be in probability terms very low, would most likely in all cases not delay the project but cause cost overruns through additional equipment and manpower utilized to finish the project as scheduled. Some additional costs may be incurred because of a modification of Arctic Gas' frost-heave program but this is not expected to be large. Arctic Gas may also have overestimated initial Mackenzie Delta reserves. However, in view of these possibilities, the estimated cost shown by Arctic Gas may be a little too optimistic, though nowhere near the disparity shown by Green Construction.

On the other hand, we believe that the answering testimony of Arctic Gas, as cited above, adequately described and quantifies the problems inherent in the El Paso proposal. Therefore Arctic Gas' contention that El Paso's cost could be at least 12 percent greater appears to be quite reasonable, particularly in view of the greater degree of nontraditional construction involved. ^{16/} The recalculation of an illustrative cost of service utilizing a fuel-use cost of \$1 per MMBtu is also consistent with the showing of Arctic Gas and necessary for a fair and equitable comparison. It is quite apparent that the high fuel-use aspects of an LNG mode of transportation make its proponent reluctant to include such costs in an illustrative transportation showing.

^{16/} These overrun calculations did not consider the lack of meaningful base data for proper seismic design of the El Paso pipeline and both the Point Gravina and Point Conception LNG terminals, which Staff believes could lead to further overruns (See Staff's Geotechnical Briefs).

It is Staff's opinion that the following costs of service per MMBtu are the most appropriate estimates for each project. 17/

	Northern Border Delivery Points	California
El Paso	\$2.41	\$1.84
Arctic Gas	\$1.61	\$1.32

As noted earlier, there is a possibility that the Arctic Gas cost may be slightly higher; however, because of the wide disparity in the unit-cost estimates, it is doubtful that such an adjustment would make any appreciable difference in the outcome.

^{\$04} These unit cost figures are based upon the Arctic Gas project as proposed. If the Arctic project is modified as we propose by the elimination of the unnecessary \$700 million western leg, the unit cost of transportation to California will be reduced by at least \$.095 and that to Northern Border delivery points by at least \$0.4. 18/ These are minimum savings figures which assume full displacement for 20 years. If displacement to California is required for only 36 MMcf/d for four years, as Staff projects, these unit cost of service savings would be more on the order of the full cost of service of the entire \$700 million western leg. 19/ The nominal annual cost of service on a \$700 million facility is \$140 million (20%). Comparing this figure with the Arctic Gas derived \$49 million annual cost of service savings resulting from elimination of the western leg, Staff concludes that the above unit-cost savings will be at least double if our assumptions about Canadian export curtailments prove to be correct.

17/ Since the lower volume cases are more assured and reflect a higher unit cost for each project, the comparisons are made on that basis.

18/ Volume 197, Tr. 33,382; Tr. 33,414; Tr. 33,469; Tr. 33,470-1; Tr. 33,476; Tr. 33,487. The nominal \$.04 per MMBtu is derived by dividing the overall \$49 million annual cost of service savings in two, half to the east, half to the west. The \$24.5 million annual savings resulting is divided by the nominal 1530 MMBtu daily Northern Border delivery multiplied by 365 days in a year.

19/ Volume 197, Tr. 33,469, Line 18.

The derivation of specific unit cost of transportation savings on nominal delivery volumes, in the absence of gas supply contracts, is piling unknowns upon unknowns. The unit cost figures we site above are as valid as those shown by Arctic Gas. For purposes of a decision on the western leg, Staff relies upon the virtual stipulation between Staff and Arctic Gas that overall, the elimination of the western leg saves the Arctic Gas project \$49 million per year in its cost of service, as a minimum. 20/

It cannot be emphasized too much that in order for the El Paso project to reflect a lower unit cost, the most pessimistic Arctic Gas costs would have to be compared with the most optimistic El Paso projection, and the fuel costs of El Paso must be left out. Any variation within this limitation results in Arctic Gas' unit costs being lower.

Alcan's presentation reflected an estimated total capital cost of \$4.72 billion for the Alaskan and Canadian portions of its system and \$1.56 billion for the facilities of Northwest and other non-participants within the lower 48 states (Ex. AP-14). Staff believes, as discussed in this brief, that the estimated cost of the Maple Leaf project, \$3.14 billion (Exhibit ST-31), should be included as part of the cost of the total system. The transportation cost (per MMBtu) for the first full year of operation under the Alcan proposal was shown as follows (Exhibit AP-14):

Los Angeles	\$1.55
San Francisco	\$1.54
Northwest Pipeline System	\$1.38
East Terminus of	
Northern Border System	\$1.59

*with or
without fuel?*

Answering testimony of Arctic Gas illustrated that the cost of the Alcan project from Prudhoe Bay to Sousa, Alberta, would be at least 12 percent greater 21/ based only upon a re-estimate of pipeline construction cost (Brackett, Tr. 245/42,778). Arctic Gas' witnesses also recalculated the cost of service for the Alcan system and argued that it would be as follows for the third year of operation (Exhibit AA-140):

20/ Volume 197, Tr. 33,476.

21/ \$3.757 billion (AP-14) versus \$4.216 billion (AA-139).

	Per MMBtu
Northwest Pipeline	\$1.536
San Francisco	\$1.674
Los Angeles	\$1.718
Northern Border Delivery Points	\$1.775

The Alcan proponents have presented several arguments that Staff must disagree with. First, that the Alcan and Maple Leaf projects can be considered independently (Br. p. 14). These projects are intertwined, as we have discussed above, and therefore their total cost must be considered when making a comparison with the Arctic Gas project. What is to be compared is the total cost of the facilities required to deliver Prudhoe Bay and Mackenzie Delta gas to their respective U.S. and Canadian markets and the appropriate allocation of such costs to the U.S. consumer. 22/ The estimated cost of the Westcoast (Item AP-T) and Alberta Gas Trunkline (Item AP-U) facilities under the Alcan project are inexorably intertwined with the facilities needed for the attachment of the Mackenzie Delta gas. In fact, after considerable cross-examination on the subject (Tr. 227/39,704, et seq.), witnesses for Alberta Gas Trunkline were still unable to detail with any specificity which facilities would be necessary for each project and their related costs.

Therefore, when comparing the Alcan and Maple Leaf projects with the Arctic Gas base case, a Maple Leaf cost of \$3.2 billion (Exhibit ST-31) for its full-volume design is applicable, and for comparison with the non-expansion case a \$2.7 billion cost for the 800 MMcf/d facilities should be utilized (Kiely, Tr. 141/22,706). *escalate*

Alcan's other argument that should be addressed is the proposition that escalated costs should be shown in order to fully reflect the advantage of that system (Br. p. 36). To begin with, Staff does not believe that the expedited Alcan schedule is realistic 23/ and will therefore result in such a cost saving as is anticipated. This is regardless of other possible cost overruns. Regardless of this scheduling discrepancy, the

22/ The other cost that could be considered in this comparison is the estimated \$1.0 to \$1.5 billion expansion required for the TransCanada system. Although our record is devoid of information on this matter and since the cost would be applicable to both the Arctic Gas and Alcan and Maple Leaf proposals and further would not be allocable to U.S. consumers, there is less need for its inclusion.

23/ See Geotechnical Reply Brief pages 15-18.

main reason that Alcan can show this supposed savings on escalated costs is the ability of the Alcan and Maple Leaf projects to shift all of the cost of the construction in the later years to the Canadian consumer. First of all, increased costs due to inflationary trends may or may not be true costs, depending upon their relationship to the overall economy. However, if this escalated cost is of the proportion and effect envisioned by Alcan, then why should the Canadians in their own interest permit the Maple Leaf project to lag behind the Alcan project by 18 months, when the so-called escalated cost of a cheaper Arctic Gas project would be borne by the consumers of both nations?

check When comparing the Alcan and Maple Leaf projects with Arctic Gas, it is imperative that the functional aspects of the several segments of each project be analyzed. To begin with, the Arctic Gas facilities necessary for the delivery of Prudhoe Bay and Mackenzie Delta gas to the Lake Zama area of Alberta and Fort Nelson, British Columbia, are estimated to be \$4.785 billion (Exhibit AA-139). This function will be performed by Alcan and Maple Leaf at a capital cost very optimistically estimated at \$6.115 billion. ^{24/} Even considering untenable arguments that the Alcan costs should not include the Maple Leaf project, the facilities to transport Alaskan gas only to Lake Zama by Alcan are estimated to cost \$3.757 billion. For this price, the consumer will get a low-pressure 42-inch pipeline with a very small amount of very high-cost expansability. We are certain that considering the differences in the length of the two pipelines, 1,272.4 miles for Arctic Gas (Exhibit AA-35) versus 1,646 miles for Alcan (Application in Docket No. CP76-433), that had Arctic Gas opted for a 42-inch pipeline following its route to transport only U.S. gas, the cost of this half measure would be less than the Alcan project. The Alcan route is 30% longer and follows mountainous terrain. The shorter Arctic Gas route follows a coastal plain and a river valley.

Even if a 42-inch pipeline had been proposed by Arctic Gas, with the Delta gas accommodated through additional looping, the overall cost, though more than the current proposal, would in all probability be cheaper than the Alcan and Maple Leaf projects.

^{24/} See Exhibit AA-17 for the facilities from Prudhoe Bay to the B. C.-Alberta border, Item by Reference AP-U for the cost of the extension from the border to Lake Zama and Exhibit ST-31 for the cost of the Maple Leaf facilities from the Mackenzie Delta to Lake Zama.

Within the lower 48 states, Alcan projects a cost of \$1.558 billion (AP-14) for the facilities of PGT/PG&E, Northwest, and Northern Border. These facilities, of course, were predicated upon Northwest receiving the State of Alaska's royalty gas and a reduction in the facilities required for Northern Border. In view of the state's contractual arrangement with Tennessee, Southern and El Paso Natural, this proposal may no longer be applicable. The facilities in the lower 48 states proposed by Arctic Gas are estimated at \$1.607 billion (AA-71).

Alcan argues that the expansion of the existing Westcoast and Alberta Gas Trunkline systems to accommodate the Alaskan volumes only will cost an estimated \$991 million (AP-14). Exhibit ST-31 reflects an estimated cost of \$783 million for the facilities relative to the transportation of Delta gas. Although, as noted earlier, the Alcan witnesses were unable to indicate the actual cost allocation between these two projects, it does appear that the Maple Leaf costs might be slightly less (Kiely Tr. 141/22,706). The Canadian Arctic facilities which are south of Lake Zama plus the Alberta Natural expansion are shown to cost an estimated \$2.381 billion for the transportation of U.S. and Canadian gas; of this, \$870 million could be attributed to Canadian use. 25/

The advantage for this segment, therefore, seems at first glance to rest with Alcan, with a savings in the order of \$600 million for the joint project or \$520 million for costs to U.S. consumers. However, not only will this slight saving be offset by an inordinately greater cost north of Lake Zama, but the resulting facilities will be of a much lower capacity and will be completely integrated with the existing Canadian pipelines wherein the U.S. consumers will, according to the proposed tariff, pay a disproportionate share of the incremental costs. 26/

Although it is possible that a single direct facility from Fort Nelson to Monchy might be more efficient and cheaper to construct and operate, the Alcan witnesses indicated that such a study was not made nor was one planned; therefore, any consideration of an improved Alcan system is mere conjecture.

25/ Canadian Arctic and Alberta Natural costs from Exhibit AA-71 less cost to Sousa shown in Exhibit AA-139.

26/ See Staff Allocation Brief.