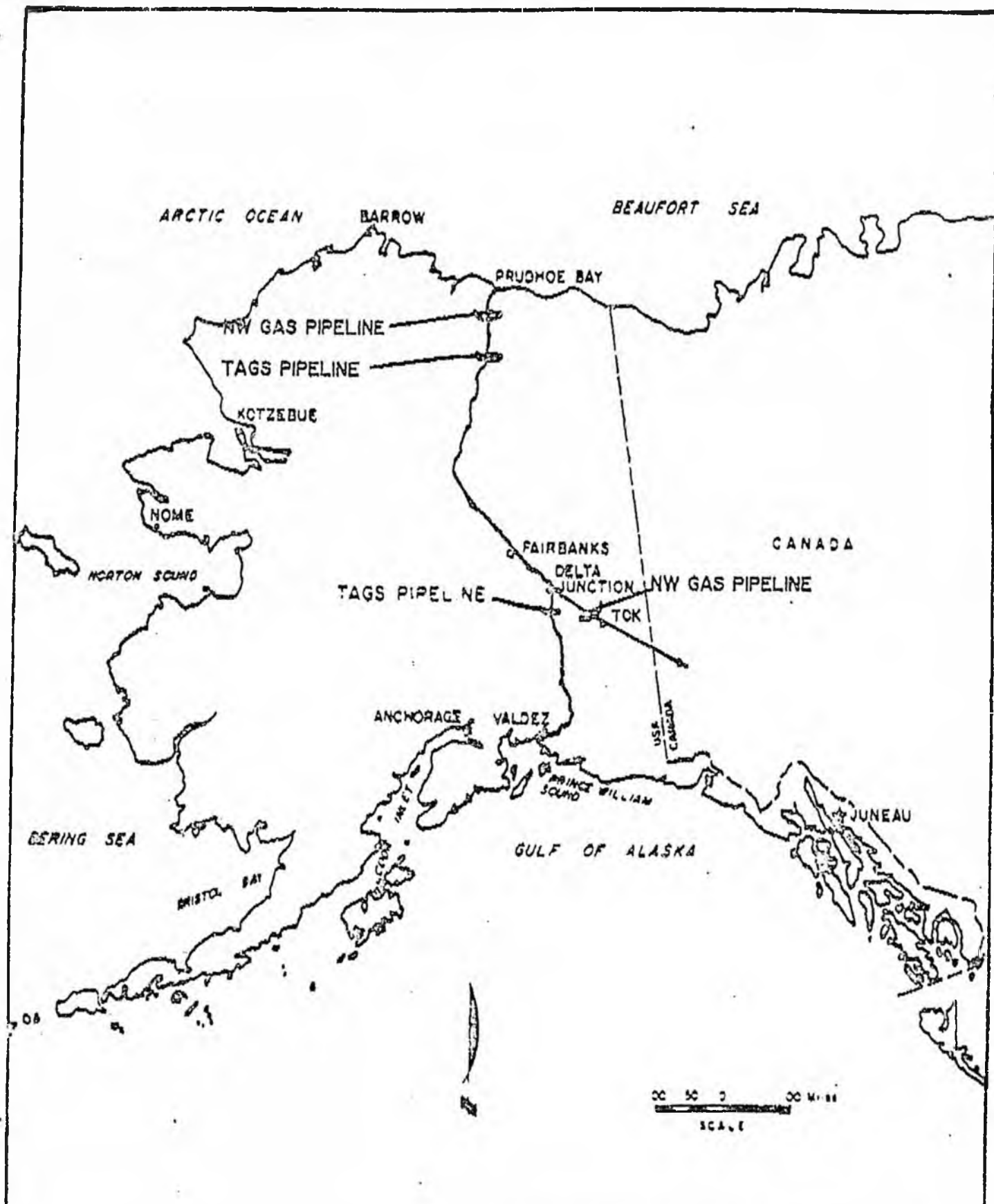


# **North Slope Gas Pipeline Overview**

NORTH SLOPE GAS BRIEFING AGENDA

Department of Natural Resources

- I. Introduction .....Jerry Brossia  
Division of Land and Water Management
  
- II. Location & Status of Proposed Gas Pipelines.....Jerry Brossia
  
- III. Location & Estimated Quantities of Gas Reserves....Bill Van Dyke  
Division of Oil and Gas



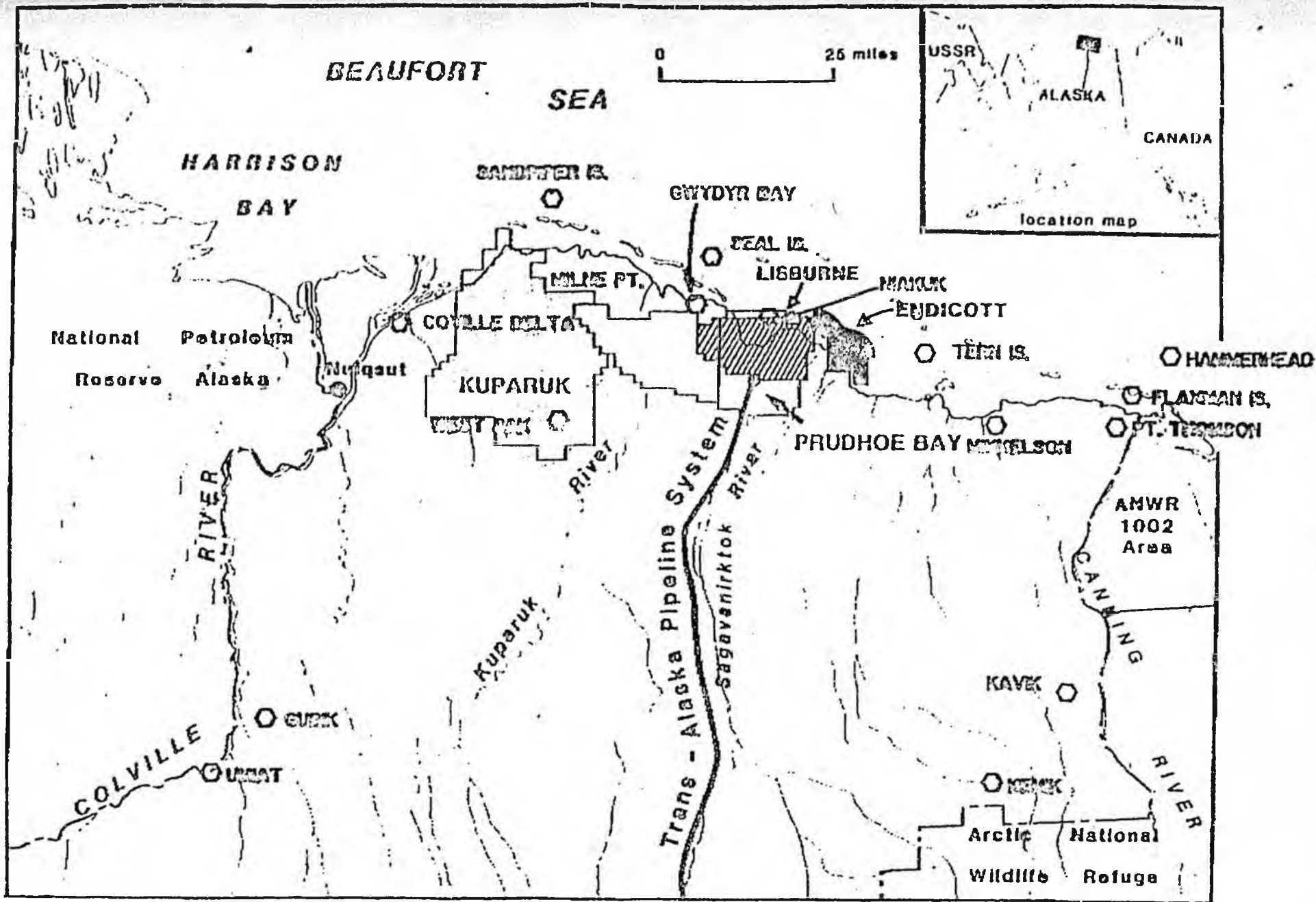
**PROPOSED GAS PIPELINES**

COMPARISON OF ANGTs AND TAGS NATURAL GAS TRANSPORTATION PIPELINES

DNR/DLMM  
March 1, 1989

COMPARISON	ANGTS	TAGS
nat gas destination	domestic use to lower 48 states	export to Pacific Rim countries
transportation method	interstate gas pipeline	intrastate gas pipeline + LNG tanker transport
transportation route in Alaska	Prudhoe Bay to Alaska-Canada border	Prudhoe Bay to Anderson Bay in Port Valdez
major project components	48 inch chilled, buried pipeline 15 compressor stations gas conditioning facility	36 inch chilled, buried pipeline 10 compressor stations LNG Plant + marine terminal
pipeline length	745 miles (Alaska segment)	797 miles
quantity of gas/day transported	2.4 billion cubic feet/day	2.3 billion cubic feet/day
estimated cost to construct	\$11.5 billion	\$8 billion
projected revenue to the state	not available	<i>ANNUAL</i> - \$477 million over the life of the project
jobs created	not available	10,000 peak, 6,000 average during construction
*****		
project status on state land	RW Lease application pending	Conditional RW Lease issued
project status on federal land	RW Grant issued	RW Grant issued

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**DEVELOPED & UNDEVELOPED GAS DISCOVERIES ON THE NORTH SLOPE**

○ DENOTES UNDEVELOPED DISCOVERIES

**Developed North Slope Oil and Gas Fields**  
(As of October 1988)

<u>Field Name</u>	<u>Discovery Date</u>	<u>Estimated Original Recoverable Reserves</u>	<u>Remaining Reserves</u>
Prudhoe Bay	12/67	25,000 BCF 10,800 MMBO	23,000 BCF 4700 MMBO
Kuparuk River	4/69	640 BCF 1340 MMBO	570 BCF 845 MMBO
Prudhoe Bay (Lisburne Pool)	12/67	900 BCF 190 MMBO	890 BCF 150 MMBO
Milne Point	10/69	60 MMBO	55 MMBO
Endicott	3/78	800 BCF 375 MMBO	790 BCF 330 MMBO
S. Barrow	4/49	25.2 BCF	8 BCF
E. Barrow	5/74	12.4 BCF	9 BCF
<b>Totals</b>		<b>27,400 BCF 12,800 MMBO</b>	<b>25,267 BCF 6080 MMBO</b>

BCF - Billion Cubic Feet of Gas  
MMBO - Million Barrels of Oil

DO&G Rev. 11/88

Figure 4

**Undeveloped North Slope Oil and Gas Discoveries**  
(As of October 1988)

<u>Name</u>	<u>Discovery Date</u>	<u>Estimated Recoverable Reserves</u>
Umlat	12/46	50 MMBO
Gubik	8/51	600 BCF
E. Umiat	3/63	?
West Sak	4/69	0 - 3000 MMBO
Kavik	11/69	?
Kemik	6/72	?
Flaxman Island	9/75	?
Pt. Thomson	10/77	5000 BCF 300 MMBO
Mikkelson	1978	?
Gwydyr Bay	1981	<10 MMBO
Tern Island	5/83	?
Seal Island	1/84	150 MMBO
Colville Delta	1985	?
Hammerhead	2/86	?
Sandpiper Island	1986	?
Niasuk Discovery	4/85	60 MMBO

BCF - Billion Cubic Feet of Gas  
MMBO - Million Barrels of Oil

Totals

1060 MMBO  
5600 BCF

DO&G Rev. 11/88

Figure 5

DRAFT 3/8/89

ORAL REMARKS OF  
CUBA WADLINGTON JR., VICE PRESIDENT FOR REGULATORY AFFAIRS  
NORTHWEST ALASKAN PIPELINE COMPANY

ALASKA STATE LEGISLATURE,  
SENATE SPECIAL COMMITTEE ON OIL & GAS  
AND SENATE RESOURCES COMMITTEE  
MARCH 10, 1989

I AM CUBA WADLINGTON JR., VICE PRESIDENT FOR REGULATORY AFFAIRS, NORTHWEST ALASKAN PIPELINE COMPANY, THE AGENT AND OPERATING PARTNER FOR ALASKAN NORTHWEST NATURAL GAS TRANSPORTATION COMPANY, THE SPONSORS OF THE ALASKAN SEGMENT OF THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM. ACCOMPANYING ME IS OUR GENERAL COUNSEL, WILLIAM J. MOSES.

MADAM CHAIRMAN, THANK YOU FOR THE OPPORTUNITY TO BE HERE TODAY TO GIVE AN UPDATE ON THE A-N-G-T-S PROJECT. VERNON JONES, WHO IS CHAIRMAN OF THE BOARD OF OUR SPONSORING CONSORTIUM, APPEARED HERE BEFORE THE JOINT COMMITTEE ON OIL AND GAS IN MARCH 1984. CONDITIONS HAVE CHANGED IN SEVERAL SIGNIFICANT WAYS OVER THE PAST FIVE YEARS. I'LL EXPLAIN WHY WE NOW HAVE A STRONGLY STRENGTHENED CONVICTION THAT THE PRUDHOE BAY GAS IS NEEDED DOMESTICALLY BY THE UNITED STATES. AND I'LL EXPLAIN WHY WE HAVE RENEWED OPTIMISM THAT TIME IS BRINGING US CLOSER TO PROJECT REMOBILIZATION.

ON JANUARY 24TH OF THIS YEAR, WE APPEARED IN ANCHORAGE BEFORE A PUBLIC CONFERENCE HELD BY THE ECONOMIC REGULATORY

ADMINISTRATION OF THE U.S. DEPARTMENT OF ENERGY. OUR PREPARED STATEMENTS AT THAT CONFERENCE PROVIDE AN UP-TO-DATE ELABORATION OF OUR OUTLOOK FOR THE ANGTS PROJECT. THEY ARE BY VERNON JONES, MYSELF, AND BY MR. JAMES JENSEN WHO IS A RECOGNIZED AUTHORITY ON OIL AND GAS ECONOMICS AND DEVELOPMENT. IN ADDITION, WE LATER FILED SUPPLEMENTAL COMMENTS WITH THE ECONOMIC REGULATORY ADMINISTRATION WHICH, I BELIEVE, ALSO PROVIDE VALUABLE BACKGROUND INFORMATION.

WITH YOUR CONCURRENCE, I WOULD LIKE TO PLACE THESE FOUR DOCUMENTS IN THE RECORD AND THEN MAKE A BRIEF ORAL STATEMENT. I HAVE EXTRA COPIES WITH ME FOR COMMITTEE MEMBERS AND STAFFS.

THE U.S. SPONSORS OF THE ALASKAN SEGMENT OF ANGTS HAVE INVESTED ABOUT \$ 1.5 BILLION JUST ON THE ALASKAN SEGMENT OF THE SYSTEM. THIS INVESTMENT IS IN DESIGN, PRELIMINARY ENGINEERING, SATISFYING GOVERNMENT REQUIREMENTS, AND CONSTRUCTION PLANNING. WE MADE THIS EXPENDITURE IN GOOD FAITH, BASED ON A FRAMEWORK OF FEDERAL LAW. THIS INCLUDED EXPLICIT COMMITMENTS TO AN OVERLAND TRANSPORTATION SYSTEM TO BRING THE 26 TRILLION CUBIC FEET OF PROVED PRUDHOE BAY GAS RESERVES TO THE LOWER 48 STATES.

WE REMAIN DEDICATED TO COMPLETING THIS PROJECT AT THE EARLIEST FEASIBLE DATE WHEN THE GAS CAN BE SOLD WITHOUT GOVERNMENT SUBSIDY, AT MARKET CLEARING-PRICES. THAT DATE IS APPROACHING MUCH FASTER THAN IS GENERALLY REALIZED.

THE FIRST KEY ISSUE THAT I'LL DISCUSS IS "NEED." IS THERE A DOMESTIC REQUIREMENT FOR THE GAS DURING THE PERIOD STARTING ABOUT 1996?

OUR CONCEPT OF DOMESTIC "NEED" FOR THE ALASKAN GAS IS BASED ON AN ECONOMIC TEST. IF THE GAS IS REASONABLY EXPECTED TO BE SALEABLE ON A FREE-MARKET BASIS IN THE LOWER-48 STATES, WITHOUT GOVERNMENT SUBSIDY, THEN IT MEETS THIS PRIMA FACIE TEST. BY DEFINITION, IF COMPETITIVELY-PRICED ALASKAN GAS IS NOT AVAILABLE, DEMAND FOR THAT ENERGY COULD BE MET ONLY IF AMERICAN CONSUMERS MAKE USE OF HIGHER PRICED AND/OR LESS DESIRABLE ALTERNATIVES.

THE CURRENTLY PROVED PRUDHOE BAY GAS RESERVES, DELIVERED TO THE LOWER-48 STATES BY A PIPELINE SYSTEM, CAN MEET THIS FREE-MARKET TEST BASED ON SIX KEY CONSIDERATIONS:

--FIRST: THE COST OF THE ANGTS. THE RECENTLY REVISED COST ESTIMATE FOR THE REMAINING ELEMENTS OF THE ANGTS WILL MAKE THE DELIVERED GAS PRICE HIGHLY COMPETITIVE DOMESTICALLY IN THE YEARS AHEAD. I WILL ELABORATE ON THIS LATER.

--THE SECOND BASIS FOR DOMESTIC NEED IS A VARIETY OF INDEPENDENT SUPPLY/DEMAND FORECASTS. REASONABLE PROJECTIONS OF A DOMESTIC "NEED" FOR THE ALASKAN GAS DURING THE YEARS AHEAD HAVE BEEN MADE BY A NUMBER OF INDEPENDENT, RESPECTED ANALYTICAL ORGANIZATIONS SUCH AS THE GAS RESEARCH INSTITUTE.

A NEW, VERY RECENT STUDY IS ATTACHED TO THE PREPARED STATEMENT OF VERNON T. JONES, WHICH HAS BEEN PLACED IN YOUR RECORD. IT LENDS ADDITIONAL WEIGHT TO OUR POSITION. THE STUDY WAS PREPARED BY THE WASHINGTON POLICY AND ANALYSIS CONSULTING GROUP UNDER THE DIRECTION OF A FORMER DEPUTY SECRETARY OF ENERGY.

ALL OF THESE SUPPLY/DEMAND STUDIES HAVE ONE THING IN COMMON: THEY PROJECT A VERY REAL NEED FOR THE PRUDHOE BAY GAS IN THE LOWER-48 STATES BY THE YEAR 2010 AT THE VERY LATEST.

--THE THIRD BASIS FOR DOMESTIC NEED IS U.S. NATIONAL ENERGY SECURITY. DOMESTIC DEMAND FOR NATURAL GAS IS ALMOST CERTAIN TO GROW BEYOND CURRENT FORECASTS DUE TO THE RAPIDLY INCREASING U.S. DEPENDENCE ON FOREIGN OIL, NOW OVER 40% AND EXPECTED TO BE ABOUT 70% BY 2010. LET ME REPEAT THAT: 70% DEPENDENT UPON FOREIGN OIL IMPORTS BY THE YEAR 2010! THAT IS AN ALARMING FIGURE, AND IT SHOULD BE OF CONCERN TO ALL AMERICANS. OUR NATION OBVIOUSLY WILL BECOME DANGEROUSLY VULNERABLE TO OIL SUPPLY DISRUPTIONS AND/OR PRICE SHOCKS. MUCH GREATER USE OF DOMESTIC NATURAL GAS PREDICTABLY WILL BECOME A PUBLIC POLICY IMPERATIVE AS AN IMPORTANT MEANS TO LIMIT THIS VULNERABILITY. THE WASHINGTON POLICY AND ANALYSIS STUDY CONCLUDES THAT GREATER DOMESTIC USE OF NATURAL GAS CAN RESULT IN A 2 MILLION BARREL PER DAY REDUCTION IN DEMAND FOR IMPORTED OIL. THE REPORT INDICATES THAT ALASKAN PIPELINE GAS IS NEEDED TO MAKE THIS POSSIBLE. THE ANGTS, AT FULL CAPACITY, WILL PROVIDE THE ENERGY EQUIVALENT OF 30 PERCENT OF THIS TOTAL--600,000 BARRELS OF OIL PER DAY. THAT'S AN IMPRESSIVE CONTRIBUTION TO U.S. ENERGY SECURITY BY ANY MEASURE.

PRESIDENT BUSH, IN ADDRESSING WAYS TO ENHANCE U.S. NATIONAL SECURITY LAST YEAR, DECLARED: QUOTE. THERE'S NO SECURITY FOR THE UNITED STATES IN FOREIGN OIL. . . WE MUST TURN TO ALTERNATIVES LIKE NATURAL GAS. UNQUOTE.

--THE FOURTH BASIS FOR DOMESTIC NEED IS ENVIRONMENTAL REQUIREMENTS. CONCERN IS GROWING ABOUT ACID RAIN, GROUND-LEVEL OZONE, CARBON MONOXIDE, ATMOSPHERIC PARTICULATES, AND THE SO-CALLED GREENHOUSE EFFECT. INCREASED USE OF NATURAL GAS CLEARLY CAN IMPROVE THE SITUATION. MORE STRINGENT STANDARDS APPEAR

INEVITABLE AND WILL RESULT IN INCREASED DEMAND FOR NATURAL GAS. THE WASHINGTON POLICY AND ANALYSIS STUDY THAT I'VE MENTIONED CONCLUDES, AND I QUOTE: A MAJOR FORCE DRIVING THE INTRODUCTION OF MORE NATURAL GAS INTO THE U.S. ECONOMY IN THE FUTURE COULD BE AN EFFORT TO MEET ENVIRONMENTAL STANDARDS IN THE MOST COST-CONSCIOUS MANNER. UNQUOTE.

BUT AN EVEN MORE COMPELLING CASE IS MADE IN A COMBINED REPORT BY THE NATIONAL ACADEMY OF SCIENCES, THE NATIONAL ACADEMY OF ENGINEERING AND THE INSTITUTE OF MEDICINE, TO PRESIDENT BUSH. AND I QUOTE:

. . . WE SHOULD EXPLORE MEANS FOR REDUCING ENERGY DEMAND WITHOUT IMPEDING ECONOMIC GROWTH, FOR EXAMPLE, BY USING FOSSIL FUELS WITH GREATER EFFICIENCY, AS WELL AS INCENTIVES AND OTHER MEANS TO INCREASE USE OF THE 'CLEANEST' FOSSIL FUELS SUCH AS NATURAL GAS. UNQUOTE.

--THE FIFTH BASIS OF DOMESTIC NEED IS THAT IMPORTS OF NATURAL GAS WILL NOT BE ENOUGH TO SATISFY DOMESTIC REQUIREMENTS. IT IS UNREALISTIC TO ASSUME THAT U.S. IMPORTS OF GAS FROM CANADA, MEXICO, OR OF LNG CAN BE OBTAINED ESSENTIALLY WITHOUT LIMITATION, INDEFINITELY AND AT MORE ATTRACTIVE PRICES THAN ALASKAN PIPELINE GAS. CREDIBLE FORECASTS WHICH TAKE BOTH PRICE AND AVAILABILITY INTO CONSIDERATION CALL FOR GAS FROM AN ALASKAN PIPELINE IN ADDITION TO SUBSTANTIALLY INCREASED LNG IMPORTS AND CANADIAN GAS.

THE CANADIAN NATIONAL ENERGY BOARD RECENTLY RELEASED A REVISED ENERGY SUPPLY AND DEMAND FORECAST. IT SHOWS CLEARLY THERE WILL HAVE TO BE INCREASING RELIANCE IN CANADA UPON GAS FROM

"FRONTIER" AREAS STARTING IN THE LATE 1990'S. ABOUT 1.2 BILLION CUBIC FEET OF GAS PER DAY FROM THE MACKENZIE DELTA AND ARCTIC ISLANDS, WHICH WILL HAVE MANY OF THE SAME ECONOMIC COSTS THAT THE BUILDERS OF THE ANGTS FACE IN CONSTRUCTING A PIPELINE FROM THE NORTH SLOPE, WILL PROBABLY START FLOWING BEFORE THE YEAR 2000.

SUBSTANTIAL MEXICAN IMPORTS, HOWEVER, DO NOT APPEAR LIKELY. MEXICAN GOVERNMENT POLICY IS TO MAXIMIZE THE USE OF NATURAL GAS DOMESTICALLY.

REGARDING LNG IMPORTS, WHEN THE LIMITED UNUSED CAPACITY IN EXISTING DOMESTIC TERMINALS IS USED UP, ANY ADDITIONAL CAPACITY CAN THEN ONLY BE OBTAINED BY A COSTLY, CONTROVERSIAL AND PROTRACTED PROCESS OF SITING AND ENVIRONMENTAL APPROVALS OF MAJOR NEW TERMINALS.

IT SEEMS CLEAR, THEREFORE, THAT THE U.S. GAS MARKET WILL BE SERVED BY A VARIETY OF SOURCES, EACH WITH ITS LIMITATIONS. IN SUCH AN ENVIRONMENT, THE OVERLAND DELIVERY OF THE PRUDHOE BAY RESERVES SHOULD BE HIGHLY COMPETITIVE. AGAIN, EACH OF THESE SOURCES WILL BE NEEDED TO MEET DOMESTIC DEMAND.

--THE SIXTH AND FINAL BASIS FOR DOMESTIC NEED IS A PROJECTED ELECTRIC POWER GENERATION SHORTFALL IN THE UNITED STATES. THIS HAS MAJOR IMPLICATIONS FOR DOMESTIC GAS DEMAND. THERE IS A VERY SERIOUS POTENTIAL SHORTFALL OF ELECTRIC POWER GENERATION CAPABILITY IN THE U.S. IN THE NEXT TEN YEARS AND ON INTO THE NEXT CENTURY. NATURAL GAS TURBINES CAN BE CONSTRUCTED QUICKLY AND AT FAR LESS COST THAN ANY TYPE OF STEAM-GENERATION PLANT. THEY ARE PROBABLY THE ONLY REALISTIC WAY TO AVERT POWER SHORTAGES.

THE U.S. ENERGY INFORMATION ADMINISTRATION RECENTLY PROJECTED A BASE-CASE NEED FOR ABOUT 127 GIGAWATTS OF ADDITIONAL ELECTRIC GENERATING CAPACITY BY THE YEAR 2000, INCLUDING ABOUT 33 GIGAWATTS CURRENTLY UNDER CONSTRUCTION. THIS TOTAL IS EQUIVALENT TO BUILDING ABOUT 127 MAJOR NUCLEAR POWER GENERATING PLANTS IN THE NEXT DECADE.

THE SIGNIFICANCE OF THIS PROJECTION IS THE 10- TO 12-YEAR LEAD TIME REQUIRED FOR REGULATORY APPROVAL AND CONSTRUCTION OF NEW STEAM GENERATION PLANTS. OBVIOUSLY, THE LEAD TIME FOR SUCH CONSTRUCTION IS BEING DISSIPATED BY EVERY PASSING MONTH. IN THE MEANTIME, NATURAL GAS COMBINED-CYCLE OR COMBUSTION TURBINES ARE RAPIDLY TAKING OVER THE MAJOR SHARE OF FUTURE PLANNED CONSTRUCTION.

THE PLAIN RESULT OF THIS GROWING RELIANCE UPON NATURAL GAS FOR ELECTRIC POWER GENERATION HAS NOT YET BEEN FULLY REFLECTED IN MOST SUPPLY AND DEMAND PROJECTIONS. THE RECENT WASHINGTON POLICY AND ANALYSIS REPORT I'VE MENTIONED, HOWEVER, STATES, AND I QUOTE:

. . . WE FELT CONFIDENT WITH A DETAILED ANALYSIS THAT SHOWED GAS SUPPLYING NEARLY ONE-SIXTH OF THE PRIMARY ENERGY USED IN GENERATING ELECTRICITY BY 2010. THIS ALONE WOULD REQUIRE ABOUT 6 TRILLION CUBIC FEET OF GAS ANNUALLY, OR MORE THAN TWICE AS MUCH AS IS BEING USED NOW BY THE ELECTRICITY INDUSTRY. UNQUOTE

A UNIQUE ATTRIBUTE OF THE PROVEN PRUDHOE BAY RESERVES, DUE TO THEIR MAGNITUDE, IS THE ABILITY TO SUPPLY A LONG-TERM -- UP TO AT LEAST 25 YEARS -- ASSURED SOURCE OF SUPPLY FOR THE

CONSTRUCTION AND FINANCING OF BASELOAD ELECTRIC GENERATING PLANTS.

IN SUMMARY OF DOMESTIC NEED, WE BELIEVE THAT BY ANY REASONABLE ASSESSMENT, THE PRUDHOE BAY GAS RESERVES WILL BE NEEDED BY AMERICAN CONSUMERS DURING A PERIOD COMMENCING ABOUT 1996.

THE REASONABLY PROJECTED DOMESTIC NEED FOR PRUDHOE BAY'S PROVEN GAS RESERVES SHOULD BY ITSELF BE SUFFICIENT TO DEMONSTRATE THAT GOVERNMENT AUTHORITIES AT ALL LEVELS SHOULD AVOID ANY ACTION THAT MIGHT JEOPARDIZE THE OVERLAND DELIVERY OF THAT GAS TO AMERICAN CONSUMERS. THERE ARE, IN ADDITION, TWO OTHER IMPORTANT CONSIDERATIONS.

FIRST: THERE IS SIMPLY NOT ENOUGH PROVED AND ECONOMICALLY TRANSPORTABLE GAS RESERVES ON THE NORTH SLOPE TO WARRANT CONSTRUCTION OF TWO MAJOR GAS CONDITIONING PLANTS AND TWO LARGE-DIAMETER PIPELINE SYSTEMS IN THE SAME TIME FRAME.

THE ONLY BASIS UPON WHICH A MAJOR GAS TRANSPORTATION SYSTEM CAN BE FINANCED AND CONSTRUCTED IS PROVED RESERVES. PROVED RESERVES, AS YOU KNOW, ARE SOMETHING ENTIRELY DIFFERENT FROM UNDISCOVERED RESOURCES AND OTHER SPECULATIVE CATEGORIES OF POTENTIAL GAS FINDINGS.

THE ANGTS HAS ALWAYS RELIED UPON THE 26 TCF OF PROVED GAS RESERVES AT PRUDHOE BAY, NOTABLY GAS ASSOCIATED WITH THE PRODUCTION OF OIL AND THEN REINJECTED INTO THE PRUDHOE BAY FIELD. THIS IS WELL ESTABLISHED IN THE PRESIDENT'S DECISION OF SEPTEMBER 1977 AND ELSEWHERE IN THE REGULATORY RECORD. THIS GAS REQUIRES MINIMAL GATHERING OR PRODUCTION EXPENDITURES. MOREOVER,

IT IS CONCENTRATED IN A SMALL AREA WITH SUBSTANTIAL EXISTING SUPPORT FACILITIES. FOR THESE REASONS, TOGETHER WITH THE LARGE QUANTITY OF PROVEN RESERVES, GAS IN THE GENERAL PRUDHOE BAY AREA--INCLUDING THE ENDICOTT, KUPARUK, AND LISBURNE RESERVOIRS--IS TRULY THE "CREAM" OF WHATEVER GAS RESOURCES MAY EXIST ON THE NORTH SLOPE. THESE CONSIDERATIONS WOULD BE IMPORTANT IN MOST OTHER PARTS OF THE WORLD, BUT THEY ARE OF CRITICAL IMPORTANCE TO ECONOMIC VIABILITY IN THE ARCTIC. WITH RESPECT TO ANY OTHER POTENTIAL, BUT UNPROVEN OR UNDEVELOPED NORTH SLOPE GAS SOURCES, WE CAN SAY WITH REASONABLE CONFIDENCE THAT--EVEN UNDER THE BEST OF CIRCUMSTANCES--UNCERTAINTIES AS TO GAS AVAILABILITY, TRANSPORTABILITY, AND COSTS WILL DELAY ANY MAJOR PIPELINE PROJECT RELYING ON SUCH POTENTIAL ALTERNATIVES UNTIL LONG AFTER A PROJECT USING THE PRUDHOE BAY GAS COMES ON STREAM.

AS INDICATED BY THE EXPERT TESTIMONY OF MR. JAMES JENSEN OF JENSEN ASSOCIATES, INC., WHOSE STATEMENT I'VE PLACED IN YOUR RECORD, THE CHOICE IS CLEAR FOR THE REASONABLY FORESEEABLE FUTURE, EXTENDING WELL INTO THE NEXT CENTURY: EITHER GAS WILL BE AVAILABLE FOR AMERICAN CONSUMERS WHEN NEEDED OR PRUDHOE BAY GAS WILL BE COMMITTED TO SOME OTHER LARGE-SCALE PURPOSE, BUT NOT BOTH.

A SECOND MAJOR CONSIDERATION FOR GOVERNMENT AUTHORITIES IS THE BODY OF UNRESOLVED LEGAL ISSUES RAISED BY YUKON PACIFIC CORPORATION'S PROPOSED EXPORT PROJECT. THESE ISSUES NO DOUBT WILL HAVE TO BE RESOLVED BY THE FEDERAL COURTS. I WILL NOT FURTHER ELABORATE OTHER THAN TO REEMPHASIZE THAT THE ANGTS SPONSORS HAVE ALREADY INVESTED ABOUT \$1.5 BILLION DOLLARS IN GOOD

FAITH RELIANCE ON EXPLICIT GOVERNMENT REPRESENTATIONS. WE WILL TAKE ALL NECESSARY ACTIONS IN THE APPROPRIATE FORUMS TO PROTECT THE SPONSORS' INTERESTS IN THAT INVESTMENT AND WILL CONTINUE TO WORK TOWARD THE STATED NATIONAL OBJECTIVE OF PROVIDING PRUDHOE BAY GAS TO LOWER-48 CONSUMERS AT THE EARLIEST OPPORTUNITY.

I SAID EARLIER THAT I WOULD ELABORATE ON THE REVISED COST ESTIMATE FOR THE ANGTS. THE DELIVERED GAS PRICE TO THE LOWER-48 STATES IS A CRITICAL DETERMINANT OF FEASIBILITY AND TIMING OF AN OVERLAND PIPELINE SYSTEM FROM ALASKA. I'LL NOW EXPLAIN WHY WE'RE CONFIDENT THAT THE PRUDHOE BAY GAS WILL BE SALABLE TO AMERICAN CONSUMERS ON A FREE-MARKET BASIS, WITHOUT GOVERNMENT SUBSIDY, DURING THE PERIOD 1996 TO 2021.

I WILL FIRST REVIEW THE PRICES PROJECTED FOR IMPORTS BY THE U.S. OF PIPELINE GAS AND LNG SO THAT WE HAVE A BASIS FOR DETERMINING WHETHER THE ANGTS GAS REASONABLY COULD BE COMPETITIVE WITH THESE POTENTIAL ALTERNATIVES.

THE GAS RESEARCH INSTITUTE, A WELL-RECOGNIZED ANALYTICAL ORGANIZATION, HAS FORECAST "ACQUISITION PRICES" AT THE U.S. BORDER FOR BOTH PIPELINE IMPORTS AND LNG OF \$3.20 PER MILLION BTUs IN 1995, \$3.32 IN 1996 AND ABOUT \$6.50 IN THE YEAR 2010. ALL OF THESE PRICES ARE EXPRESSED IN CONSTANT 1987 DOLLARS.

A RISING TREND IN REAL PRICE--THAT IS, IN ADDITION TO ANY INCREASES IN THE GENERAL PRICE LEVEL DUE TO INFLATION--IS CLEARLY EVIDENT. IT IS IMPORTANT TO NOTE THAT GRI FORECASTS AN INCREASING TOTAL DOMESTIC DEMAND FOR NATURAL GAS THROUGH 2010 DESPITE THIS INCREASE IN REAL PRICES. WITH THESE FIGURES AS A BACKGROUND FOR COMPARISON PURPOSES, I WILL ADDRESS THE PRICE AND

MARKETABILITY OF ALASKAN GAS AS DELIVERED BY PIPELINE THROUGH CANADA TO THE U.S. BORDER.

BEFORE DOING SO, I WOULD OBSERVE THAT EXPERT GAS MARKET ANALYSTS REASONABLY MIGHT DIFFER OVER ANY PARTICULAR FORECAST OF GAS PRICES, WHICH NECESSARILY IS BASED ON ASSUMPTIONS REGARDING FUTURE ECONOMIC GROWTH, WORLD OIL PRICES, ETC.

OF OVERRIDING IMPORTANCE, HOWEVER, IS THE FACT THAT THERE IS A CONSENSUS AMONG QUALIFIED OBSERVERS THAT THE REAL PRICE OF BOTH LOWER-48 GAS PRODUCTION AND GAS IMPORTS WILL RISE OVER THE YEARS AHEAD. ONLY THE RATE OF INCREASE MAY DIFFER. THIS FACT, AS I WILL DEMONSTRATE, VIRTUALLY ASSURES THE DOMESTIC MARKETABILITY OF ALASKAN PIPELINE GAS AND LEAVES OPEN ONLY THE QUESTION OF SPECIFIC TIMING.

NOW, THE SALABILITY OF ALASKAN PIPELINE GAS OBVIOUSLY WILL BE DETERMINED BOTH BY THE CAPITAL COSTS OF THE PIPELINE SYSTEM AND THE WELLHEAD PRICE OF THE GAS.

IN MAY 1988, THE U.S. AND CANADIAN SPONSORS OF THE ANGTS COMPLETED AN IMPORTANT REESTIMATE OF THE CAPITAL COST OF THE REMAINING ELEMENTS OF THE ANGTS. THE STUDY DREW UPON AN EXTENSIVE BODY OF PROPRIETARY AND CONFIDENTIAL INFORMATION DEVELOPED SINCE OUR EARLIER COST ESTIMATES PREPARED IN THE LATE 1970s AND EARLY 1980s. IT TOOK INTO CONSIDERATION:

- ADVANCES IN PIPELINE DESIGN,
- INFORMATION GATHERED FROM EXTENSIVE FIELD TESTING PROGRAMS AND OPTIMIZATION STUDIES CONDUCTED BY THE PROJECT SPONSORS, AND
- SIGNIFICANT CHANGES IN THE ECONOMIC CLIMATE.

THE RESULT WAS A DRAMATICALLY LOWER COST ESTIMATE, RESULTING IN PART FROM THE FOLLOWING:

- REDUCED CONSTRUCTION SCHEDULE,
- IMPROVED WELDING TECHNOLOGY,
- MORE TRADITIONAL OWNER/CONTRACTOR FUNCTIONS,
- USE OF EXISTING COMMUNICATION SYSTEMS,
- REDUCED CONTINGENCY ALLOWANCES,
- HIGHER PRESSURE, SMALLER DIAMETER MAINLINE PIPE, BUT HIGHER GAS THROUGHPUT, AND
- MORE MODEST ASSUMPTIONS ABOUT THE RATE OF INFLATION AND INTEREST RATES.

EXPRESSED IN 1988 DOLLARS, THE CAPITAL COST OF THE PROJECT, INCLUDING THE NORTH SLOPE CONDITIONING PLANT, TOGETHER WITH THE REMAINING PIPELINE SEGMENTS IN ALASKA, CANADA AND THE LOWER-48 STATES, WAS ESTIMATED AT \$14.6 BILLION, COMPARED TO \$26.1 BILLION IN THE EARLIER ESTIMATE--APPROXIMATELY A 45% REDUCTION. THIS, IN TURN RESULTED IN A NEW, LOWER COST OF THE PIPELINE DELIVERY SERVICE.

BASED ON THE NEW CAPITAL COST ESTIMATE, THE TRANSPORTATION COST OF DELIVERING ALASKAN GAS TO THE LOWER-48 STATES IS \$2.44 PER MILLION BTUS IN THE YEAR 1996, EXPRESSED IN 1987 DOLLARS.

WITH A REASONABLE ALLOWANCE FOR THE WELLHEAD PRICE OF THE GAS ADDED, THE ALASKAN GAS OBVIOUSLY WOULD BE COMPETITIVE WITH THE PROJECTED PRICE IN 1996 OF \$3.32 FOR IMPORTS AND LNG THAT I MENTIONED EARLIER.

UP TILL NOW, I'VE USED A 1996 INITIAL IN-SERVICE DATE AS AN EXAMPLE. THE ANGTS GAS WOULD BE COMPETITIVE AT THAT TIME BASED

ON THE PROJECTED PRICES; HOWEVER, THE SPECIFIC DATE THAT THE ALASKAN GAS WILL FLOW WILL BE DETERMINED BY ACTUAL DEVELOPMENTS IN THE MARKET PLACE, INCLUDING THE WORLD PRICE OF OIL. IN THIS REGARD, SEVERAL KEY FACTORS WILL MAKE THE ANGTS GAS MUCH MORE SALABLE AS TIME PASSES. THEY ARE:

--FIRST, THE CAPITAL COSTS OF THE "PREBUILT," OPERATING PORTIONS OF THE SYSTEM--ABOUT 1/3 OF THE TOTAL MILEAGE--CONTINUE TO BE DEPRECIATED. THIS RESULTS IN A PROGRESSIVELY LOWER TRANSPORTATION COST OF SERVICE, AND --SECOND, AS I'VE PREVIOUSLY STATED, THE REAL COST OF GAS IMPORTS, LNG, AND OTHER ALTERNATIVES IS PROJECTED BY MOST OBSERVERS TO RISE SUBSTANTIALLY OVER TIME. ON THE OTHER HAND, BOTH THE PRUDHOE BAY GAS PRICE AND PIPELINE CONSTRUCTION COSTS SHOULD REMAIN ESSENTIALLY LEVEL IN REAL DOLLAR TERMS. THE PRUDHOE BAY GAS, IT SHOULD BE NOTED, WILL INCUR VIRTUALLY NO ADDITIONAL PRODUCTION OR GATHERING COSTS. THE NET EFFECT IS TO MAKE ALASKAN PIPELINE GAS PROGRESSIVELY MORE ATTRACTIVE THAN POTENTIAL ALTERNATIVES IN THE YEARS AHEAD.

THE ANGTS SPONSORS RECOGNIZE CLEARLY THE RADICALLY ALTERED DOMESTIC GAS MARKET TODAY AS COMPARED TO THE LATE 1970s WHEN THE ALASKA GAS PIPELINE PROJECT WAS INITIATED. AT THAT TIME, A HANDFULL OF MAJOR INTERSTATE GAS TRANSMISSION COMPANIES PLANNED TO PURCHASE THE PRUDHOE BAY GAS FOR RESALE FROM THEIR OWN INVENTORY. EVEN THEN, IT WAS DETERMINED THAT THIS GAS WOULD BE ACCESSIBLE TO LOCAL DISTRIBUTION COMPANIES IN 47 OF THE LOWER-48 STATES. TODAY, WITH THE EMPHASIS ON OPEN ACCESS TO

TRANSPORTATION SERVICES, WE EXPECT AN EVEN MORE WIDELY SPREAD UTILIZATION.

WE HAVE NOTED PREVIOUSLY THAT THE LONG-TERM, ASSURED SOURCE OF SUPPLY REPRESENTED BY THE PRUDHOE BAY GAS IS HIGHLY ATTRACTIVE. THESE ATTRIBUTES ARE PARTICULARLY IMPORTANT AS GAS INCREASINGLY BECOMES THE FUEL OF CHOICE FOR MAJOR ELECTRIC GENERATING PLANTS. THE SUCCESSFUL FINANCING OF MAJOR COMBINED-CYCLE AND COMBUSTION TURBINE GAS PLANTS REQUIRES ASSURANCE OF GAS SUPPLY AND REASONABLY PREDICTABLE PRICES. THE ALASKAN GAS, THROUGH THE ANGTS, CAN MEET THAT REQUIREMENT.

AS THE SO-CALLED GAS "BUBBLE" DISSIPATES OVER THE NEXT TWO YEARS, AS MOST RESPONSIBLE OBSERVERS PREDICT, THE SPOT MARKET FOR GAS PURCHASES IS LIKELY TO BECOME MORE UNPREDICTABLE AND, THEREFORE, LESS ATTRACTIVE. UNDER THESE CIRCUMSTANCES, WE FORESEE A RENEWED RECEPTIVENESS TO LONG-TERM SUPPLY ARRANGEMENTS, WHICH WILL SUPPORT BUILDING THE ANGTS.

IN SUMMARY, ALASKAN PIPELINE GAS, BASED ON REASONABLE PRICE PROJECTIONS FOR POTENTIAL ALTERNATIVES, SHOULD BE VERY SALABLE IN THE DOMESTIC MARKET DURING THE PERIOD COMMENCING ABOUT 1996. THE DELIVERED GAS WILL BE INCREASINGLY COMPETITIVE EACH YEAR THAT PASSES FROM 1996 FORWARD INTO THE NEXT CENTURY AS THE REAL PRICES OF ALTERNATIVES CONTINUE TO RISE.

IN CLOSING, I WANT TO REITERATE THE ANGTS SPONSORS' CONVICTION THAT THE PRUDHOE BAY GAS RESERVES WILL BE NEEDED BY AMERICAN CONSUMERS. ONLY THE PRECISE TIMING OF AN OVERLAND PIPELINE DELIVERY SYSTEM CANNOT BE SPECIFIED. ONE FINAL NOTE: WE ARE VERY MUCH AWARE OF YOUR INTEREST, ALONG WITH MOST OTHER

ALASKANS, IN SEEING THE NORTH SLOPE GAS BROUGHT TO MARKET AT THE EARLIEST POSSIBLE DATE. WE SHARE THAT INTEREST. WE SINCERELY BELIEVE THAT AN OVERLAND PIPELINE SYSTEM TO SERVE THE DOMESTIC U.S. MARKET REMAINS THE BEST AND THE EARLIEST POSSIBILITY TO MEET THAT OBJECTIVE. THANK YOU AGAIN MADAM CHAIRMAN.



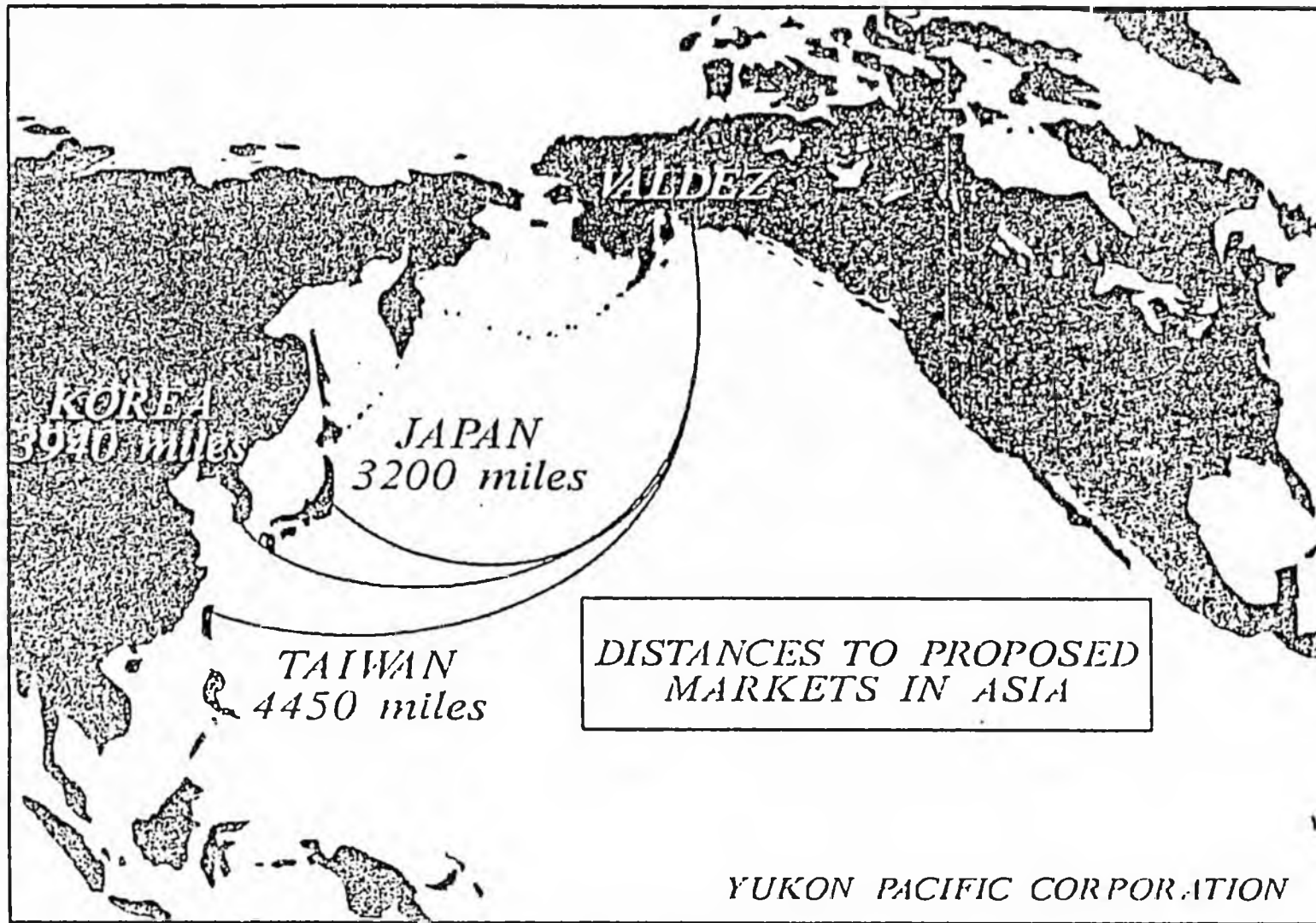
YUKON  
PACIFIC  
CORPORATION  

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TRANS-ALASKA PIPE SYSTEM

# CSX Corporation

- Majority owner of Yukon Pacific
- Major transportation company
- 1987 turnover:  
\$8 billion on \$13.2 billion in assets



# Phase I TAGS Permits

1. Define F.E.R.C. role
2. Obtain Federal Right-of-Way  
(requires Environmental Impact Statement)
3. Obtain Presidential Finding  
(required under ANGTA)
4. Obtain State Right-of-Way
5. Obtain Federal Export License

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\* Application pending, awaiting decision

YUKON PACIFIC CORPORATION TASKS

PHASE II

- o Detailed Design
- o Detailed Permitting
- o Final Cost Estimate
- o Final Contracts

# Asian LNG Demand by 2000

(million tons)

	<u>Currently under Contract</u>	<u>Projected by 2000</u>		<u>Total New Demand</u>	
		1987	1989	1987	1989
Japan	34.0	38.0	48.0	4.0	14.0
Korea	2.0	3.5	8.7	1.5	6.7
Taiwan	<u>1.5</u>	<u>3.0</u>	<u>4.5</u>	<u>1.5</u>	<u>3.0</u>
TOTAL	37.5	44.5	61.2	7.0	23.7

Source: Government and Research Institute Projections in each country

# Reasons for LNG Demand Growth in Asia

- Greater electricity demand than expected
- LNG more competitive, especially vs. nuclear
- Rising environmental concerns
- Diversification to reduce energy source risk
- Distribution infrastructure is growing

# Alaska LNG is Competitive in Asia

- Price competitive
- Economies of scale
- U.S. a secure supplier
- Expand U.S. trade where most needed

# Capital Cost Estimates

(\$ millions)

	<u>To Deliver 7MMT/YR</u>	<u>To Raise to 14MMT/YR</u>	<u>TOTAL</u>
Alaska facilities	6,816	1,824	8,640
Shipping	<u>980</u>	<u>1,120</u>	<u>2,100</u>
Total	\$7,796	\$2,944	\$10,740

# Economic Feasibility

- Sales threshold of 7-8.5 mmt in mid-1990's.
- Economic studies based on \$24/bbl crude oil and LNG price of \$4/mmbtu.
- Price will fluctuate up and down with crude oil.
- Alaska does not have a posted crude oil price.

# TAGS Gas Supply

North Slope Gas Reserves                      36 TCF

Undiscovered Resources                      102 TCF

## Gas Ownership:

ARCO, EXXON, British Petroleum,  
State of Alaska and minor owners

"Undiscovered, recoverable supplies of natural gas from Alaska's North Slope may exceed 100 trillion cubic feet."

Presidential Finding Excerpt  
Yukon Pacific Corporation  
Exhibit "M"

## STATE INCENTIVES TO MOVE FORWARD

- Tax, Royalty Income of \$ 1-2 million/day.
- 10,000 Construction jobs.
- 550 Permanent jobs.
- Spur to other exploration, refining
- Alaska's largest opportunity

# What can the State do to help?

- Continue International Trade Office efforts. Customers and competitors are governments; it helps for our government to lend support.
- Continue cooperative efforts in right-of-way and environmental permitting.
- Maintain stable tax climate.
- Enter into royalty gas sales discussions when appropriate.



**BP EXPLORATION**

**B.E. Grote**  
Vice President  
Commercial, Alaska

BP Exploration (Alaska) Inc.  
900 East Benson Boulevard  
P.O. Box 196612  
Anchorage, Alaska 99519-6612  
(907) 564-5121

## BP EXPLORATION POSITION REGARDING NORTH SLOPE NATURAL GAS

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- BP Exploration is the owner of approximately 25% of the 26 trillion cubic feet of gas at Prudhoe Bay.
- We are determined to see the gas developed as soon as possible and have continuously sought out alternatives for moving the gas to market.
  - We have been a member of the ANGTS Design and Engineering Cooperative Agreement since 1980.
  - We have evaluated a wide range of options, including TAGS, since the initial delay of ANGTS announced in 1982.
- In March, 1984, we spoke before the Alaska State Legislature Joint Committee on Oil and Gas indicating our support of ANGTS as the most likely means of getting gas to market.
- While BP Exploration continues as an ANGTS participant, we now believe that the progress made by Yukon Pacific warrants full consideration.
- E.J.P. Browne, Chief Executive, BP Exploration, U.S.A., stated in February that BP is willing to work with Yukon Pacific to determine if the TAGS project is possible and would be prepared, under the right circumstances, to commit our gas to the project.
- Both ANGTS and TAGS face a number of major hurdles -- most serious of which are the uncertainties of future energy prices and the sheer scale of both projects.
- In the absence of a gas pipeline, we still strive to get maximum benefit from the gas being produced -- as fuel for field production facilities and the Trans-Alaska Pipeline, as a component of miscible injectant for enhanced oil recovery, and finally by reinjecting the remainder to maintain reservoir pressure.
- The State of Alaska can help progress North Slope gas development by working to prevent the creation of any barriers that would restrict the range of options available for consideration.

March 10, 1989

STATEMENT OF JUDD MILLER, JR.  
VICE PRESIDENT, EXXON COMPANY, U.S.A.  
BEFORE THE SENATE SPECIAL COMMITTEE ON OIL AND GAS  
ALASKA STATE LEGISLATURE  
MARCH 10, 1989

My name is Judd Miller, Jr., Vice President of Exxon Company, U.S.A. I am responsible for Exxon's marketing and transportation of natural gas in the United States. Exxon appreciates the opportunity to testify at this hearing today on the prospects of commercializing North Slope gas.

Summary

Substantial gas reserves exist on the North Slope of Alaska. Exxon, like the state and its citizens, has a substantial interest in seeing these reserves commercialized. However, the reserves are far distant from any market. The transportation system required will be huge both in scope and magnitude of dollars required with a long lead time needed to bring the project into operation. Before such a project can move forward there must be evidence of markets and prices sufficient to provide reasonable assurance to the many participants that the investment will be sound. Today, neither an overland pipeline to the lower 48 states nor the export of liquified natural gas (LNG) to Far East markets is economic. Real growth in energy prices and in market demand will be necessary before any project to move North Slope gas reserves to market can be economic.

Since the discovery of the Prudhoe Bay field over 20 years ago, Exxon has considered and reconsidered many alternative methods of commercializing the gas reserves including a pipeline to the lower 48 states, liquefaction and shipment to domestic or foreign markets, and less conventional alternatives such as chemical conversion to methanol or petrochemical facilities at a south Alaska tidewater location. Based on these studies, Exxon believes that the best market for Alaska's North Slope gas will be the lower 48 states and that an overland pipeline will be the best mode of transportation to that market. We have serious concerns that LNG made from North Slope gas would not be competitive in Far East markets because of the large and unique pipeline investment required; an investment that competing LNG suppliers in the Far and Middle East would not incur.

Nevertheless, the Trans-Alaska Gas System (TAGS) sponsors are to be complimented for their efforts to develop an outlet for North Slope gas. Although we have serious reservations about the LNG export project, Exxon does not want to discourage anyone from proposing promising alternatives for commercializing Alaska's North Slope reserves.

Introduction

I would like nothing better than to tell you today that commercial development of Alaska's North Slope reserves is at hand. However, I cannot do that. In reality, neither an overland pipeline to the lower 48 states nor the export of LNG to Far East markets is economic at today's prices. An assured market and a substantial real growth in energy prices will be required before a project to commercialize North Slope gas reserves can be economic. Exxon believes that such a market will develop in the lower 48 states which will

ultimately be the best market for North Slope gas. We further believe that an overland pipeline is the best mode of transportation to that market.

Exxon, like the State and its citizens, has a substantial interest in seeing these reserves commercialized. Exxon has approximately a 37 percent working interest in the gas reserves in the Prudhoe Bay Field and significant interests in Point Thomson and other nearby fields. Commercialization of these reserves would provide new job opportunities, further economic development and additional revenue for Alaska, as well as substantial income for Exxon.

### Project Scope and Fundamentals

The Prudhoe Bay Field alone is estimated to contain 26 Tcf of gas.<sup>1</sup> There is also an estimated 8 Tcf of gas in Point Thomson and other nearby fields.<sup>2</sup> Any project to commercialize reserves of that magnitude would be a major, world-scale endeavor by any standards. Whether it is an overland pipeline to the lower 48 states or the export of LNG to Far East markets, it will be one of the largest privately financed projects in the free world.

The magnitude of the financial and business undertakings are as significant as the physical scope of the facilities. Large investments will be required -- \$10 billion or more -- and the lead times will be long -- 5 or more years of substantial investment -- before a single dollar of revenue will be received and many more years before any return on the investment can be realized. Numerous interests must be brought together, including the owners of the gas on the North Slope, the buyers of the gas, the pipeline owners, governments and financial institutions. Financing will require complex arrangements involving numerous entities and will only be possible if the project's economic basis is fundamentally sound.

Investors in a project of that magnitude will require stable supplies, dependable markets and a product which can be priced at a competitive level. In addition to these market fundamentals, a stable government fiscal and regulatory environment will be essential.

### Alternatives Considered to Market North Slope Gas

Since the discovery of the Prudhoe Bay Field, Exxon has considered and reconsidered many alternative methods of commercializing Alaska North Slope gas reserves. These considerations have included overland pipelines to the lower 48 states and transportation of the gas to a tidewater port for liquefaction and shipment to domestic or foreign markets. Less conventional

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<sup>1</sup> Alaska Department of Natural Resources, Historical And Projected Oil And Gas Consumption January 1989.

<sup>2</sup> Id.

alternatives, such as chemical conversion to methanol and locating petrochemical facilities at tidewater have also been studied. Based on our consideration of many alternatives, we have consistently concluded that the best market for North Slope gas will develop in the lower 48 states and that an overland pipeline will be the most economical and efficient method for delivering the most energy to that market.

At the time the present project for an overland pipeline was selected by the President and Congress, a competing project was also considered under which North Slope gas would be transported by pipeline to a tidewater port on the southern coast of Alaska and there liquified and shipped as LNG to California. That project was ultimately rejected because an overland pipeline could transport gas more efficiently and could be expanded at lower cost than an LNG project. Following selection of the Alaska Natural Gas Transportation System (ANGTS), Exxon participated as a member of the pipeline/producer consortium performing the design and engineering of the system. We remain active in that consortium to this day.

#### Overland Pipeline to Lower 48 States

Studies by the American Gas Association<sup>3</sup> and Gas Research Institute<sup>4</sup> have concluded that North Slope gas can be accommodated in the lower 48 states after the year 2000 and that energy prices will increase to a level which will make North Slope gas economic. These studies indicate that the Lower 48 demand will be sufficient to accommodate all domestic gas production, imports from other countries, as well as gas from the North Slope of Alaska. Our conclusions are generally consistent with those studies. We are optimistic that an overland pipeline to deliver the gas to the lower 48 states can be constructed in the time frame indicated by the studies.

In 1988, the pipeline sponsors of the ANGTS announced a 45 percent reduction in their prior cost estimate for the ANGTS. Given the improvements in pipeline design and construction techniques since their prior estimate, Exxon agrees that the cost of building the ANGTS can be significantly reduced as suggested by the ANGTS pipeline sponsors. Further reductions in cost that would enhance the economics of transporting the gas to the lower 48 states may also be possible.

An overland pipeline is a safe and efficient means of transporting energy over long distances. In addition, an overland pipeline can be expanded at relatively low cost if needed to accommodate new discoveries. Such expansion capability would encourage exploration for new gas reserves.

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<sup>3</sup> American Gas Association, The Gas Energy Supply Outlook, October 1987.

<sup>4</sup> Gas Research Institute, 1987 GRI Baseline Projection Of U.S. Energy Supply And Demand To 2010, December 1987; 1988 GRI Baseline Projection Of U.S. Energy Supply And Demand (Preliminary) August 1988.

The use of North Slope gas in the lower 48 states will enhance U.S. energy security and ensure a stable long term supply of environmentally desirable fuel. Utilization of North Slope gas to meet U.S. energy needs can back out 400,000 to 600,000 barrels per day of imported oil.

### Trans-Alaska Gas System

Lately, much attention has been focused on exports of North Slope gas as LNG to markets in the Far East. Governor Hickel and the team at Yukon Pacific are to be complimented for their efforts to develop the TAGS project. The TAGS project is a complex project consisting of integrated pipeline, liquefaction, shipping and regasification facilities. The 800-mile pipeline through Alaska would, in itself, be a project rivaling the Trans-Alaska oil pipeline. The LNG facility would be one of the world's largest and would require a substantial LNG ship fleet as well.

Exxon has considered the export of North Slope gas to the Far East and I must tell you that we have serious reservations that such a project would be competitive with other supplies in that market. Because of the substantial investment required to transport North Slope gas across Alaska, the LNG from such a project would be at a severe competitive disadvantage relative to other Far East and Middle East sources of LNG that would not be burdened by such a large pipeline investment. The supplies of LNG potentially available from these other sources vastly exceed any forecasts of demand for LNG in the Far East.

I have two charts that demonstrate this graphically. The first is a map which shows the potential supplies of LNG for Far East markets. The numbers shown under each country represent that country's gas reserves expressed in trillions of cubic feet. As shown, there is a lot of gas in the Far East and Middle East. The arrows from Alaska reflect the distances that North Slope LNG would be transported using tankers that are estimated to cost 2.4 billion dollars. The dashed line across Alaska represents the 5.4 billion dollar pipeline to Valdez, which, on an investment basis, is equivalent to adding 7,600 miles to the LNG shipping distance. Thus, North Slope gas is effectively 11,000 miles from Japan. 11,000 miles is roughly equal to one-half the circumference of the earth, therefore, all else being equal, LNG from almost anywhere in the world could be delivered more economically to the Far East than North Slope gas.

The table on my next chart puts shipping distances and potential supplies for the Far East into perspective. Shown are various countries arranged by their distance to Japan. Shown for each country are its estimated total proven reserves, the reserve which may be needed to meet current contracts assuming they are extended to the year 2020, and the remaining uncommitted reserves. As you can see, there are 1,127 trillion cubic feet of uncommitted reserves that are effectively closer to Japan than Prudhoe Bay. That volume is roughly 33 times the total known reserves on the North Slope. Assuming an export volume of 14 million tons of LNG per year, the suppliers closer to Far East markets than the North Slope could deliver that volume for over 1,400 years.

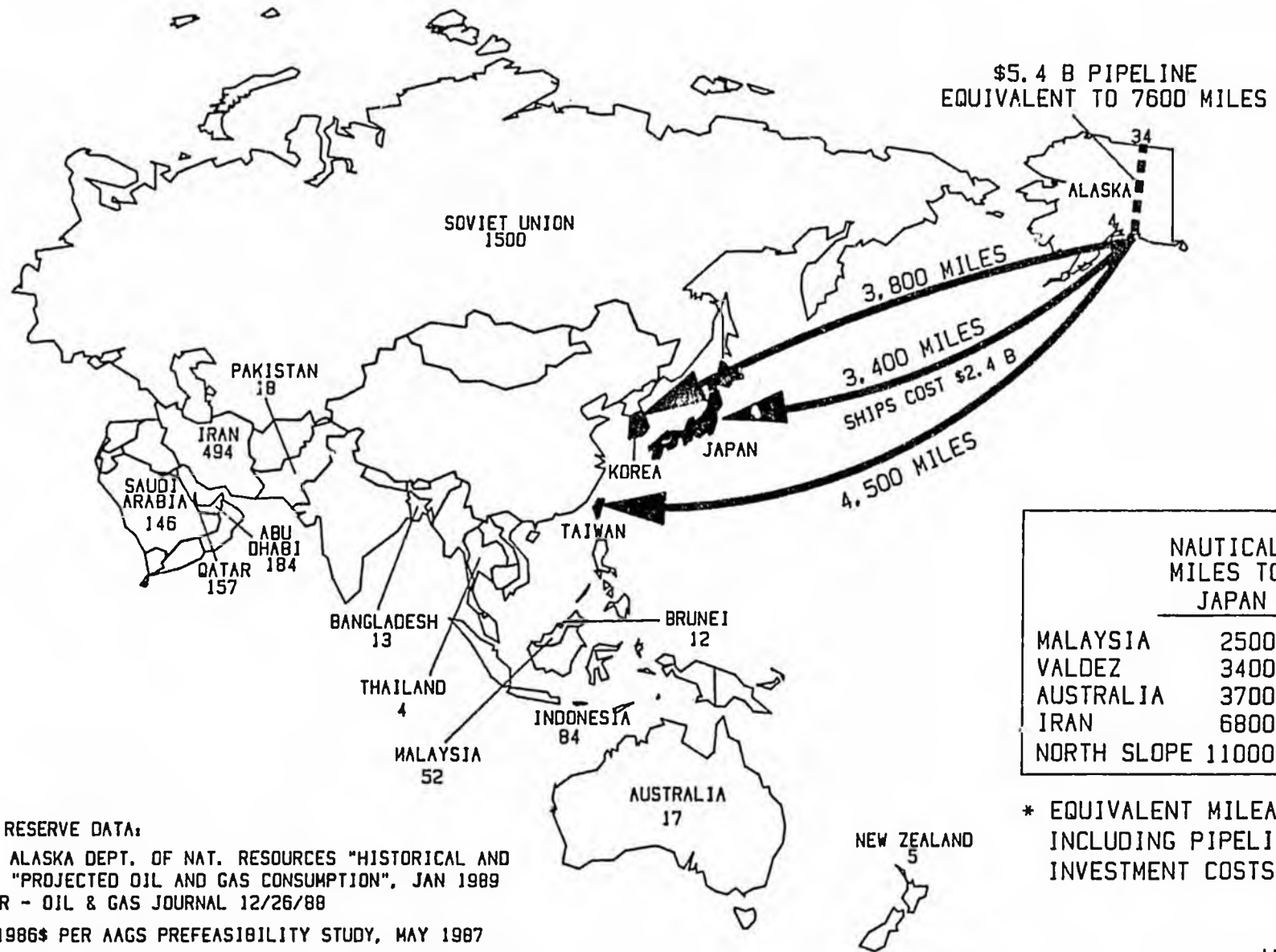
I would not want to be interpreted as suggesting that all of these reserves will be made available to Far East markets soon or even ever. However, it is clear that should Far East demand grow so that the full TAGS volume of 14 million tons of LNG per year could be accommodated, North Slope LNG would be the high cost supply in a potentially oversupplied market and thus, would not be competitive with other LNG supplies. (It should be noted that in Exxon's view, a smaller 7-8 million tons of LNG per year project would be grossly uneconomic.) It is also clear that there are ample supplies of gas in other countries that could be competitive in Far East markets.

### Conclusion

Alaska's North Slope gas reserves are an important component of the energy future of both Exxon and the state of Alaska. On balance, Exxon continues to believe that an overland pipeline to the lower 48 states will be the best alternative for commercializing North Slope gas. In reaching this conclusion, numerous alternatives to bring these reserves to market have been studied. While Exxon has serious reservations about an LNG export project, we would not want to discourage anyone from proposing promising alternatives for commercializing the reserves. We will continue to examine options to market North Slope gas considering the market fundamentals against which any project must be tested.

# POTENTIAL SUPPLIERS OF LNG TO FAR EAST MARKETS

XX = TCF OF RESERVES



## SOURCE OF RESERVE DATA:

ALASKA - ALASKA DEPT. OF NAT. RESOURCES "HISTORICAL AND  
"PROJECTED OIL AND GAS CONSUMPTION", JAN 1989

ALL OTHER - OIL & GAS JOURNAL 12/26/88

COSTS IN 1986\$ PER AAGS PREFEASIBILITY STUDY, MAY 1987  
DISTANCES PER "WORLD-WIDE MARINE DISTANCE TABLES", 1976

\* EQUIVALENT MILEAGE  
INCLUDING PIPELINE  
INVESTMENT COSTS.

## POTENTIAL SUPPLIERS OF LNG TO FAR EAST MARKETS

COUNTRY	APPROXIMATE NAUTICAL MILES TO JAPAN	ESTIMATED PROVED RESERVES (TCF)		
		TOTAL	REQUIRED TO MEET EXISTING CONTRACTS IF EXTEND TO 2020	UNCOMMITTED
Brunei	2400	12	9	3
Malaysia	2500	52	11	41
Indonesia	2900	84	26	58
Thailand	3000	4	-	4
U.S.-South Alaska	3400	4	2	2
Australia	3700	17	11	6
Bangladesh	4500	13	-	13
New Zealand	4800	5	-	5
Pakistan	5800	18	-	18
Abu Dhabi	6300	184	4	180
Qatar	6500	157	-	157
Saudi Arabia	6600	146	-	146
Iran	6800	494	-	494
Reserves effectively closer than North Slope:		1190	63	1127

33 TIMES THE KNOWN NORTH SLOPE  
 GAS RESERVES. EQUIVALENT TO  
 14 MT OF LNG (.8 Tcf) PER YEAR  
 FOR OVER 1,400 YEARS.

### SOURCE OF TOTAL RESERVES DATA:

- South Alaska & North Slope - Alaska Department of Natural Resources publication entitled "Historical and Projected Oil and Gas Consumption" published January 1989.
- All others - Oil & Gas Journal 12/26/88

DISTANCES PER "WORLD-WIDE MARINE DISTANCE TABLES", 1976