

SCOMM

79:1

Recommended Approach to Moving Ahead on North Slope Royalty Gas Sales

- Request for Proposal (RFP) for long-term dedication of half of Alaska's Prudhoe Bay in-kind royalty gas (~1.5TCF)
 - work with all potential consumers
 - contract development with Royalty Board and Legislature under existing regulations
 - contract terms for consideration would include:
 - signing bonus(es); contract maintenance payments prior to sales and investment credit offsets; and "highest of" pricing terms
- Continue technical work with all project sponsors through Joint Pipeline Coordinator's Office
- Analyze production management implications of gas sales on all North Slope oil and gas fields
 - confidential review of Prudhoe Bay intermediate reservoir modeling results
 - update all plans of development
- Maintain contact with other North Slope gas owners on progress in marketing gas
- Participate in any joint consumer/producer/project sponsor studies

H.C. Heinze
1/23/92

**PRESENTATION TO THE
HOUSE FINANCE AND
HOUSE OIL AND GAS COMMITTEES**

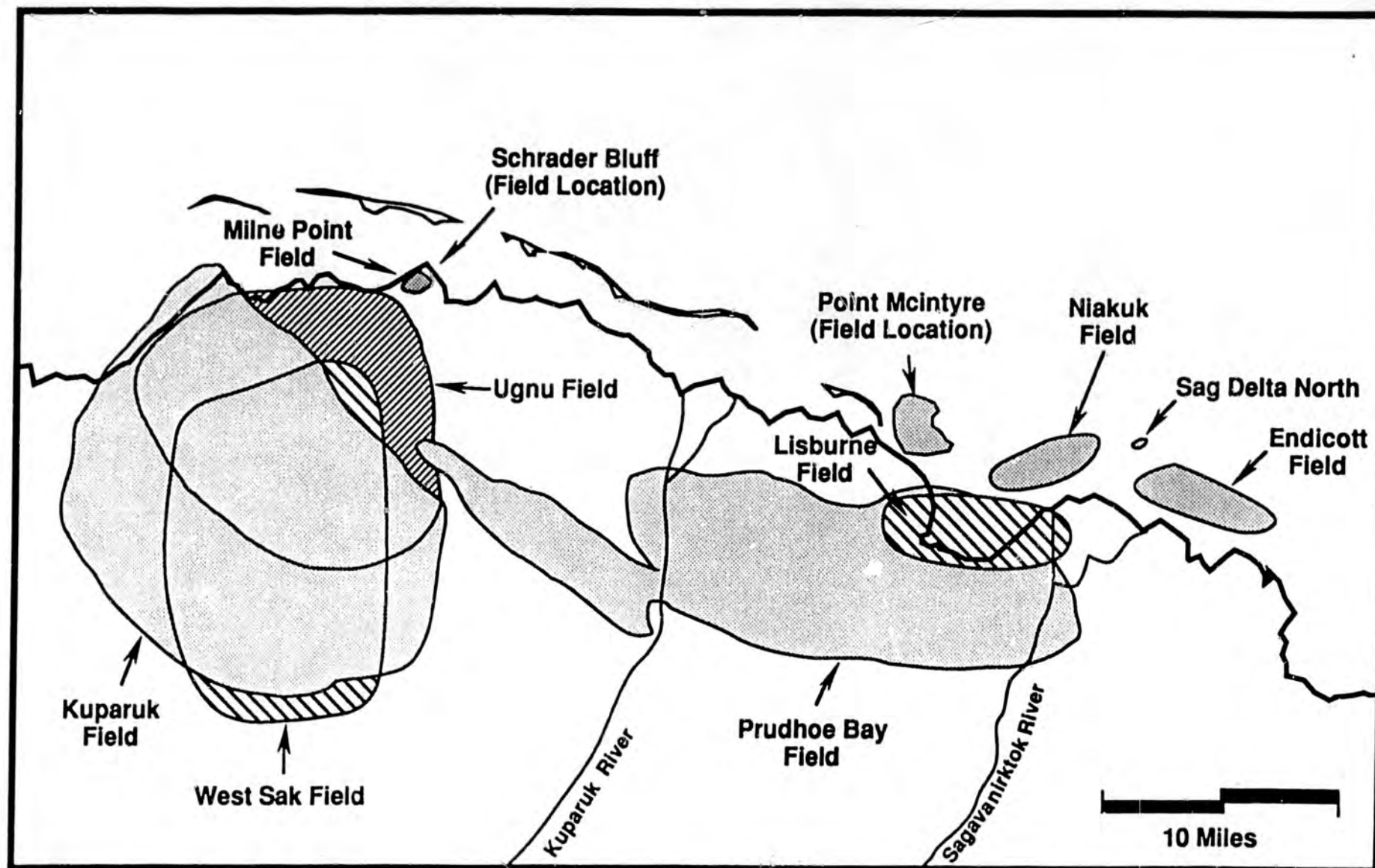
**KEVIN MEYERS, ARCO ALASKA, INC.
DAVE SZABO, BP EXPLORATION (ALASKA), INC.**

JANUARY 23, 1992

Outline

- **Prudhoe Bay Field Background** D. J. Szabo
- **Prudhoe Bay Development History** D. J. Szabo
- **Field Maintenance** D. J. Szabo
- **Future Development** K. O. Meyers
- **PBMGP Public Hearing** K.O. Meyers
- **Major Gas Sales** K. O. Meyers

North Slope Oil Fields



PRUDHOE BAY FACT SHEET

FIELD AREA	150,000 Acres (234 sq. miles)
Original Liquids In Place	22 Billion Barrels
Original Gas In Place	46 TCF
Total Liquids Production to 1/1/92	7.6 Billion Barrels
Remaining Reserves	Approximately 4.4 Billion Barrels
Current Liquid Rate	1.3 Million BPD
Current Gas Production	5.3 Billion CFD
Current Water Production	1 Million BPD
Current Wells	1,080
Total Projected Wells	1,300 +

History - Development Highlights

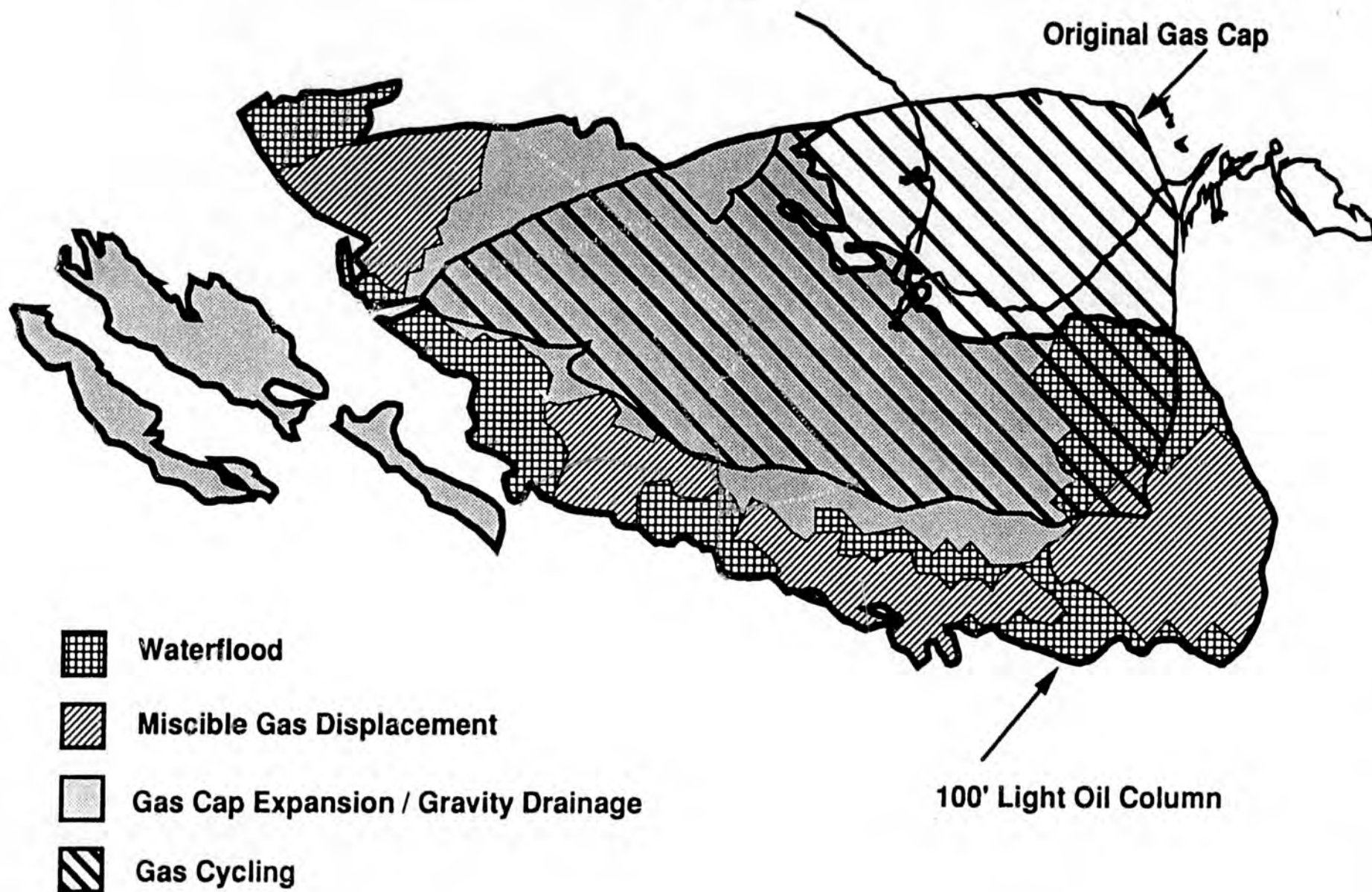
- **Field start-up** 1977
- **Low pressure separation** 1982
- **Produced water injection** 1982
- **80-Acre drilling** 1982
- **Flow Station #3 injection project (FS-3 IP)** 1982
- **Artificial lift (Gas Lift)** 1984
- **Source water injection** 1984
- **Central gas facility (CGF) start-up** 1987
- **Large-scale miscible gas injection (PBMGP)** 1987
- **West End start-up** 1988
- **Gas Handling Expansions (GHX-1)** 1990
- **Hurl State start-up** 1990
- **40-Acre drilling pilots** 1991
- **GHX-2 early opportunities** 1991
- **Produced water handling expansions** 1989-91
- **NWFB infill drilling phase I** 1992

DEVELOPMENT COSTS TO DATE 22 BILLION DOLLARS (1991 \$)

Reservoir Processes

- **Reservoir is being depleted by four dominant processes:**
 - **Gas cap expansion/Gravity Drainage**
 - **Waterflood**
 - **Miscible gas displacement**
 - **Gas cycling**
- **Each process individually very efficient and relatively easy to manage**
- **Effective management of all processes requires the melding of the processes into an integrated strategy which maximizes the ultimate hydrocarbon recovery of the field**

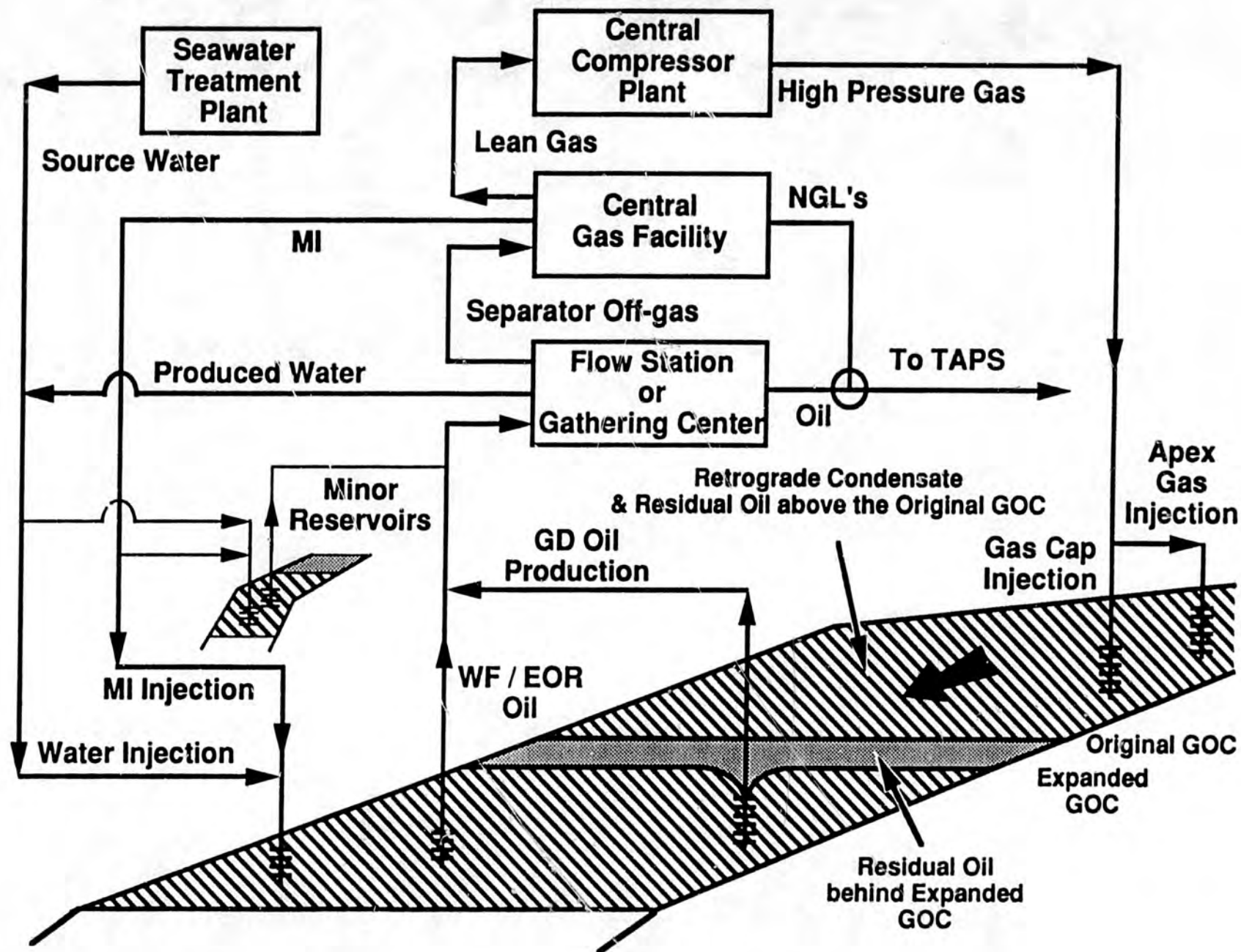
Prudhoe Bay Development Plan Recovery Processes as of 1/91



Reservoir/Facility Integration

- **Current infrastructure is a combination of highly integrated systems**
 - **Four dominant reservoir processes**
 - **Six integrated production centers**
 - **Centralized gas processing/compression**
- **Continued development of Prudhoe Bay must recognize, understand, and enhance the intricate balance of reservoir and surface processing mechanisms**

PBU Facilities / Reservoir Schematic



Wellwork/Capacity Sustainment

- Well stimulation/workover program during next five years
 - 50 fracture treatments per year
 - 300 non-frac acid/chemical treatments per year
 - 200 non-rig workover jobs per year (gas/water shut-offs, profile modifications)
 - 85 workovers per year to repair wells
 - 35 sidetrack (replacement) wellbores per year
- 85 MBOPD average yearly rate benefit
- ^{\$225}~~\$22~~ MM average yearly cost

Infrastructure Optimization and Maintenance

- **Sidetracks (re-use of existing wellbores)**
- **Debottlenecking to improve facility efficiency**
- **Corrosion control and repair**
- **Low cost tie-ins for new wells**
 - **"Twinned" wells**
 - **Re-use facilities from suspended/abandoned wells**

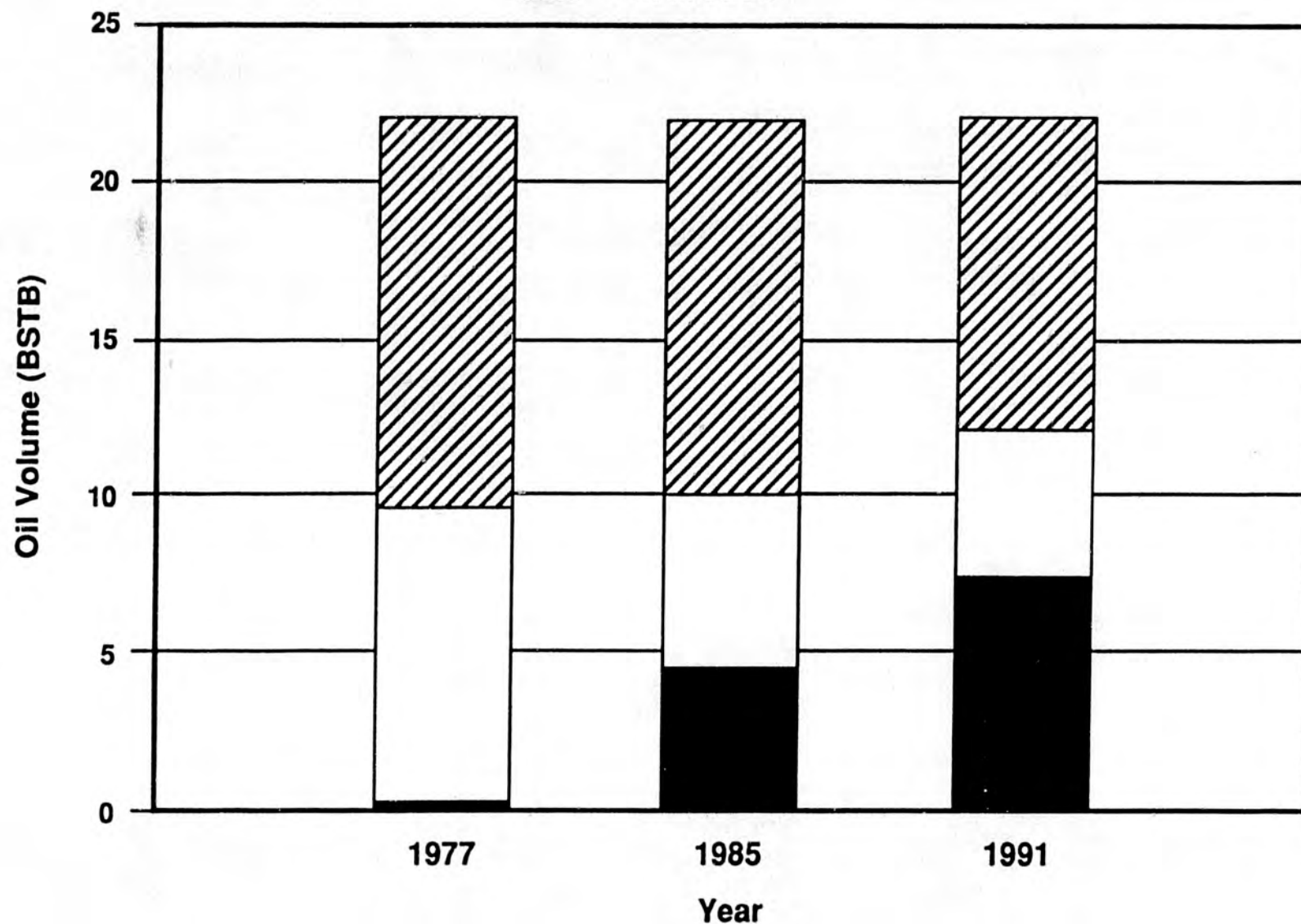
Prudhoe Bay Development

- **Sequential, deliberate, and logical evolution**
 - **Based on reservoir performance, laboratory analysis, and geological and engineering studies**
 - **Exploits each region of the reservoir in a manner which maximizes ultimate recovery**
 - **Preserves gas for future sales**
- **State of the art technology has and will continue to be applied to maximize Prudhoe Bay recovery**
- **Reservoir performance is exceeding expectations**

ALASKA STATE LEGISLATURE
PRUDHOE BAY RESERVOIR DEVELOPMENT AND MANAGEMENT

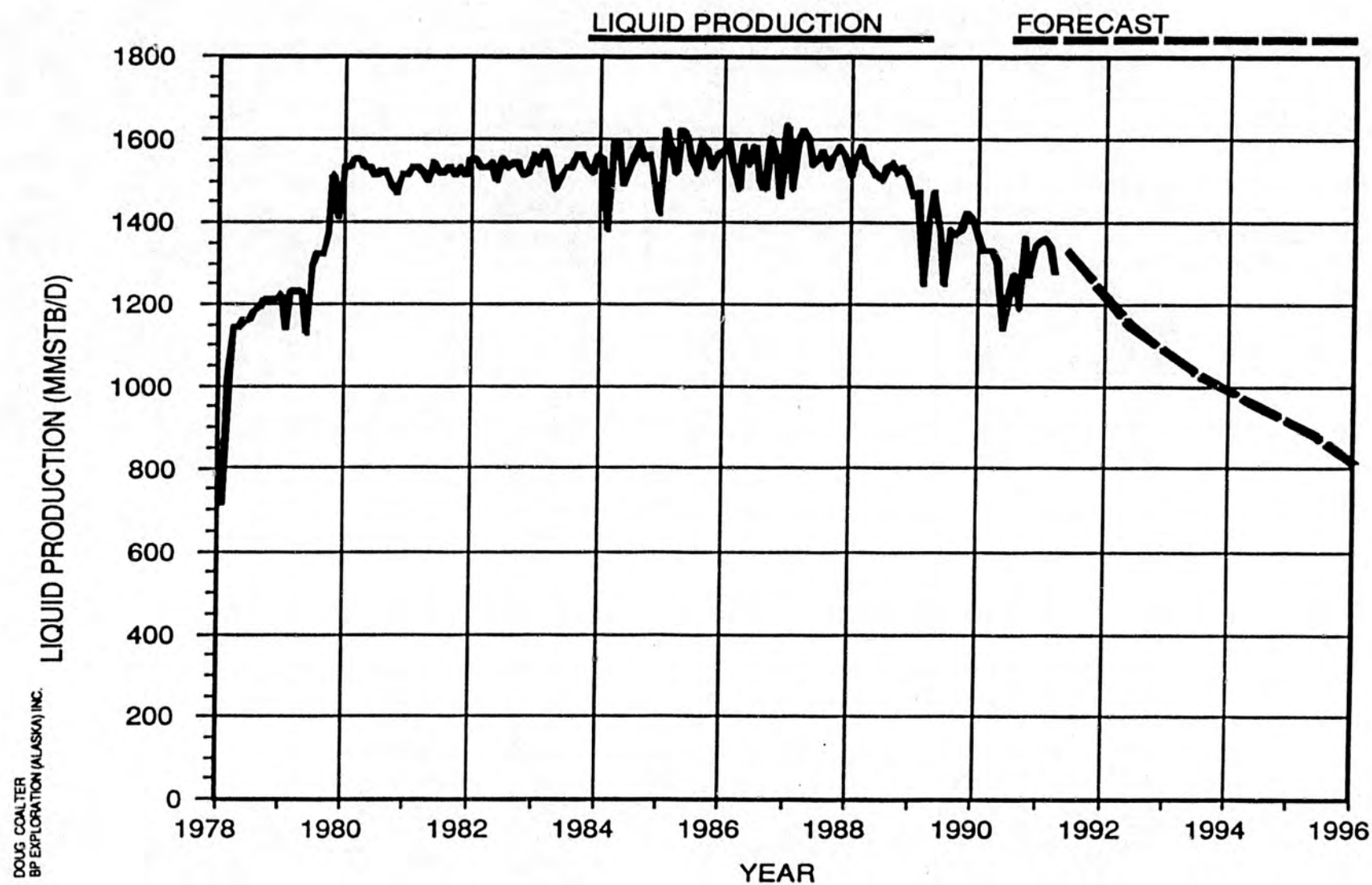
Prudhoe Bay Liquid Reserves

-  Remaining Oil in place
-  Reserves
-  Production



ALASKA STATE LEGISLATURE
PRUDHOE BAY RESERVOIR DEVELOPMENT AND MANAGEMENT

PRUDHOE BAY PRODUCTION



Development Philosophy

- **Continue to improve our understanding of the reservoir rock/fluids/processes**
- **Monitor reservoir performance**
- **Adapt Plan as appropriate in response to that performance**
- **Continue to assess new opportunities**
- **Field test as appropriate**
- **Provide for long-term flexibility for uncertainties, including gas sales**
- **Do not preclude gas sales**

Development Plan

- **Well stimulation/workovers**
- **Drilling**
- **GHX-2 project**
- **EOR expansions**

Development Plan

- **Drilling (250-400 additional wells)**
 - **Complete nominal 80-acre well development (1200 total wells)**
 - **Nonconventional (high angle) wells drilled to exploit thin oil columns**
 - **Peripheral waterflood area drilling**
 - **Waterflood pattern size reduction**
 - **40-acre development, potentially up to 100 forty-acre wells**
 - **Expected cost 1 - 1.5 billion (1991 \$)**
 - **EOR infill drilling**

Development Plan

- GHX-2
 - Increase gas handling, processing, and injection from 5.3 to 7.5 BCFPD during 1994 and 1995 time frame
 - Apex gas injection starting in 1994
 - Expected rate increase 100 MBPD in 1995
 - Expected additional recovery 330-450 million barrels
 - Expected cost ^{as spent} 1.4 billion (1991 \$)
1.3 - 1.5

Development Plan - EOR Expansions

- **PBMGP Areal Expansion**
 - **Doubles the size of the current flood**
 - **Over 60 new patterns**
 - **100 new wells**
 - **110 - 150 million barrels of additional reserves**
- **NWF₃ Infill Expansion**
 - **Infill current patterns to contact reservoir rock unswept by MI**
 - **24 New wells**
 - **40 - 70 million barrels of additional reserves**
- **Central gas facility expansions to increase miscible injectant supply to 700 million SCF per day**

Prudhoe Bay Development Plan Summary

- **Major Constituents:**
 - **Well stimulation/workover program**
 - **Drilling**
 - **GHX-2 project**
 - **EOR expansions**
- **\$3+ billion planned capital investments**
- **Recovery will approach or may even exceed 12 billion barrels of oil, about 2.5 billion barrels more than the original plan**
 - **Over half of this increase is the result of gas related projects**
- **EOR and Gas cycling processes will become the predominant recovery mechanisms in the future**
- **Production will decline an average of 8 - 10 percent per year over the next decade**
- **Does not preclude a major gas sale**

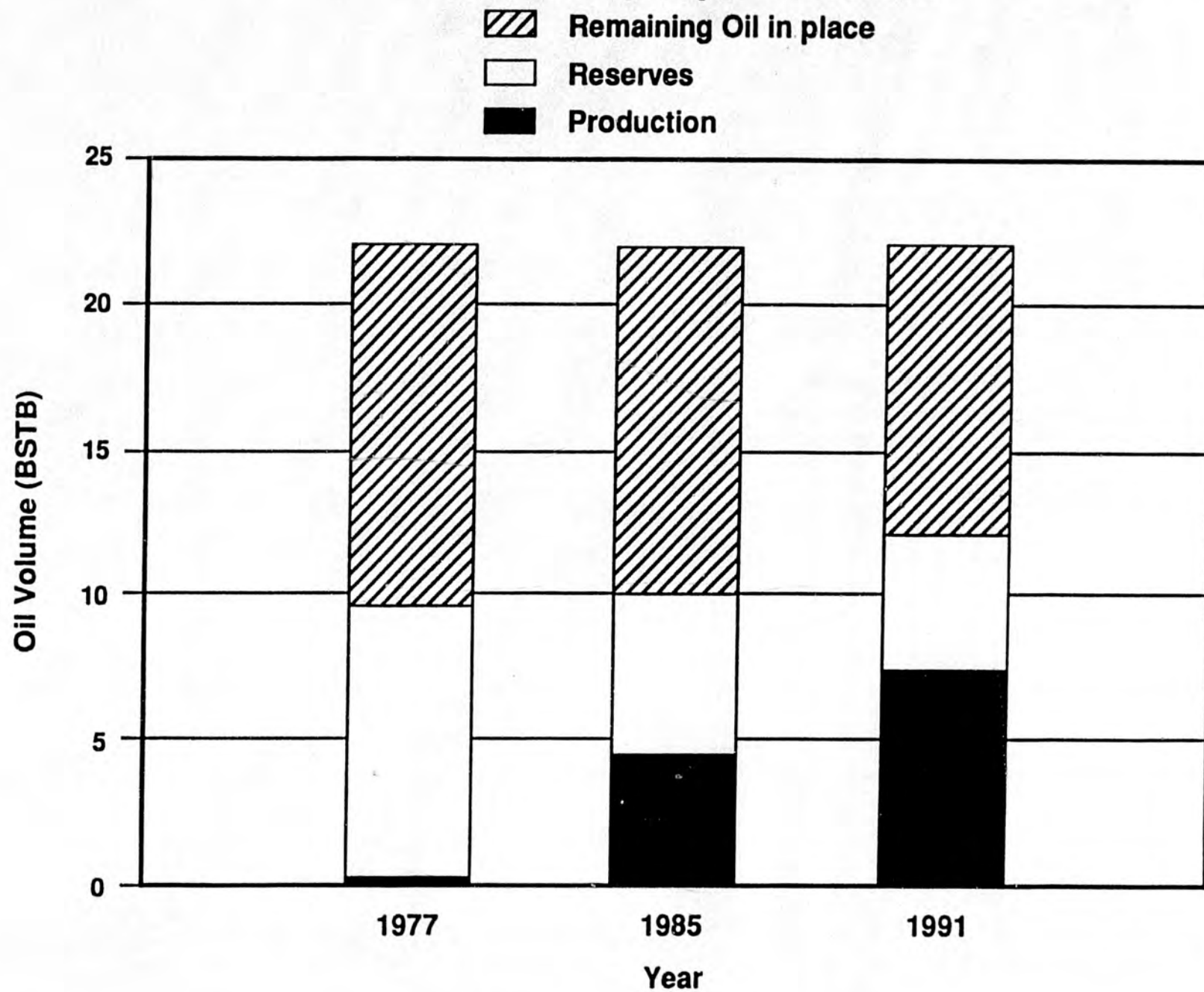
**ALASKA STATE LEGISLATURE
PRUDHOE BAY RESERVOIR DEVELOPMENT AND MANAGEMENT**

Resource Commitment

- **Three major owners actively participate in Prudhoe Bay reservoir development and management**
- **Over 500 petroleum professionals directly involved in field operations and development**
- **Extensive efforts in technology development and application**
 - **Access to worldwide technical expertise**
 - **State of the art technology applied in all aspects of reservoir development and management**

ALASKA STATE LEGISLATURE
PRUDHOE BAY RESERVOIR DEVELOPMENT AND MANAGEMENT

Prudhoe Bay Liquid Reserves



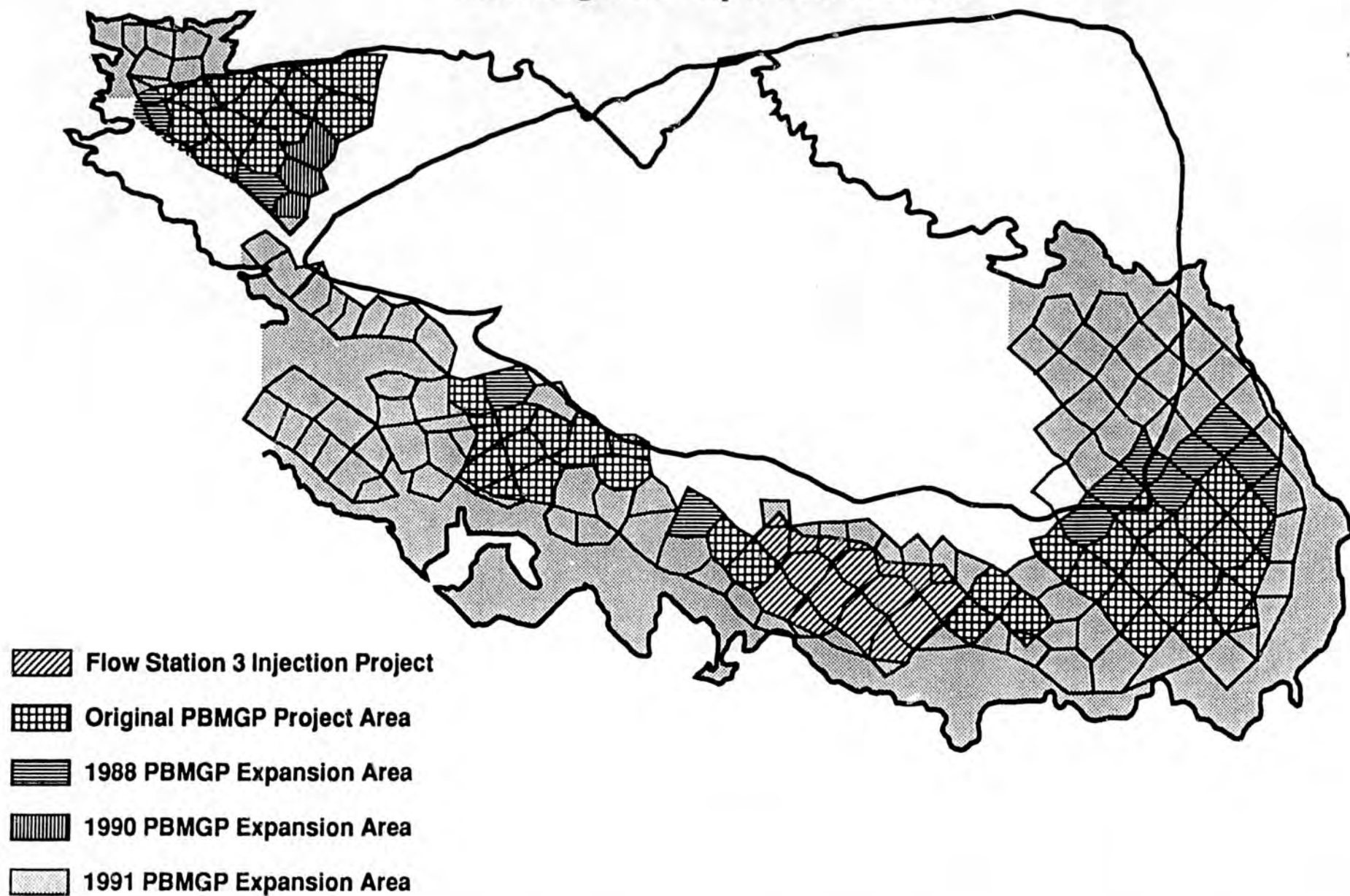
**AOGCC Hearing
Objectives**

- **Update of Prudhoe Bay development activities**
- **Approval of the areal expansion of the PBMGP**
- **Endorsement of the PBMGP expansion plans and NWFB Infill expansion project**
- **Approval of proposed amendment to PBMGP Conservation Order 195, Rule 2**

Prudhoe Bay EOR Development History

- **1982 Flow Station 3 injection project**
 - **11 patterns**
- **1984 original PBMGP**
 - **43 proposed patterns**
- **1986 Recertification of PBMGP**
 - **43 redefined patterns**
 - **Included 11 Sag River patterns**
- **1988 PBMGP expansion**
 - **Added 13 new patterns**
 - **Added 10 Sag River patterns to PBMGP, 9 to FS-3 IP**
- **1990 PBMGP expansion**
 - **Added 3 new patterns**
- **1991 PBMGP areal and NWFB infill expansions**
 - **AOGCC hearing**

Prudhoe Bay Miscible Gas Project Existing and Expansion Areas



PBMGP Conservation Order 195, Rule 2

- **Requires that the reservoir pressure in the PBMGP be maintained at or above an average of 3600 psi**
 - **Mandated to insure PBMGP miscibility**
- **Expected pressure decline is 30 psi/yr**
 - **Fuel gas**
 - **Oil production**
- **The PBMGP pressure is expected to decline to approximately 3100 psi by the end of project life**

PBMGP Conservation Order 195, Rule 2

- **Current development plan fully accommodates pressure decline, is prudent, avoids waste, and is expected to yield high recoveries**
- **Rule 2 not required for PBMGP miscibility**
 - **As reservoir pressure drops, C2 - C4 content in the MI must increase to maintain miscibility with the reservoir oil**
 - **CGF can make miscible injectant compositions that are miscible to reservoir pressures as low as 2000 psi**
- **Given the CGF's ability to manufacture a range of MI compositions, the appropriate reservoir management criterion is miscible injectant composition/miscibility and not a reservoir pressure limitation**
- **Such a miscibility criterion was requested from the Commission**

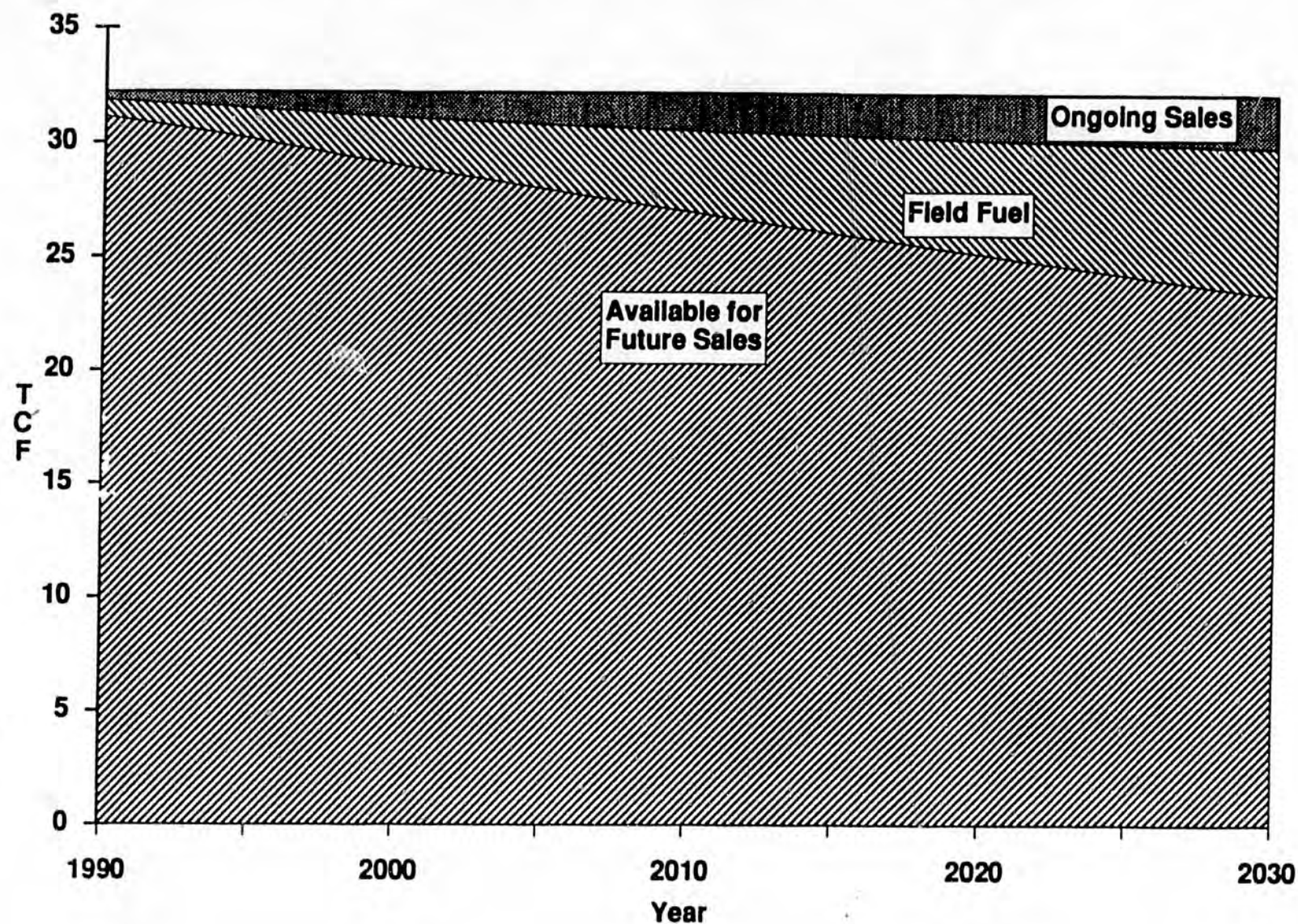
Major Gas Sales

Utilization of Gas Resource (Post GHX-2)

- **Natural Gas Liquids Sales:** 60,000+ barrels per day
- **Fuel:** 460 million SCF/day
Necessary for liquid production
- **Local Gas Sales:** 40 million SCF/day
- **Miscible Injectant:** Up to 700 million SCF/day
Yields 500+ million barrels of EOR oil reserves
- **Gas Cycling/Gravity Drainage:** 7.5 BCF/day field offtake
- **Gas Lift:** Up to 1.2 BCF/day
- **Field gas offtake and lift gas are integral to achieving total remaining liquid reserves of 4.4 billion barrels**

ALASKA STATE LEGISLATURE
PRUDHOE BAY RESERVOIR DEVELOPMENT AND MANAGEMENT

Disposition of Hydrocarbon Gas Resources



Major Gas Sales Key Assumptions

- **Gas Sales**
 - 2 BCF per day hydrocarbon gas delivered to market
 - 2.8 BCF per day hydrocarbon delivered to Gas Conditioning Plant
 - Rejected CO₂ returned to reservoir, resulting in net voidage due to sales of 2.4 BCF/D
 - Increases pressure decline to ~75 psi/yr
- **Reference Case (without Major Gas Sales)**
 - Maintain field gas offtake at level achieved with GHX-2 (7.5 BCF/D)
 - Waterflood/EOR patterns completed by 2015
 - Field viable down to a liquid production rate of 100 MSTB/D (until ~2030)
- **Field life highly sensitive to oil prices, tax and regulatory burdens, operating costs, and transportation costs**

Impact of Major Gas Sales

- **Major gas sales prior to waterflood/EOR completion (2015) do not permit simultaneous increase in field gas offtake**
 - **Continuing need for artificial lift prevails early in gas sales project**
 - **Deliverability (reservoir energy) of gas is limiting later**
- **Benefits of extensive field development activities implemented in 1990s to maximize liquid recovery are diminished with early major gas sales**

<u>Major Gas Sales Date</u>	<u>Incremental Recovery, STB</u>
2005	-0.4 billion
1997	-1.0 billion

Causes of Reserve Losses

Black Oil (~50%)

- **Reduction in well inflow performance increases significance of hydraulic limitations, leading to less optimal use of gas handling capacity**
- **Accelerated solution gas evolution decreases mobility of remaining oil**
- **Accelerated shrinkage of oil reduces effectiveness of drag oil mechanism**

Compositional (40-50%)

- **Ultimate gas throughput reduced**
- **Vaporization is more effective at higher pressures**

EOR (0-10%)

- **Need for richer MI reduces supply and potentially shortens project life**

Impact of Major Gas Sales

- **With major gas sales after waterflood/EOR completion (2015), existing facilities allow for increase in field gas offtake**
 - **Latent gas separation and dehydration capacity exists due to reduced need for artificial lift with waterflood abandonment**
- **Gas sales may support significant extension of field life, leading to higher ultimate liquid recovery than reference case (100-500 million STB)**
- **Key Uncertainties**
 - **Long term viability of TAPS**
 - **Economic viability of late life production**

Major Gas Sales

Summary

- **Later major gas sales from Prudhoe Bay increase ultimate hydrocarbon liquid recovery**
- **Any major gas sales strategy must consider the total hydrocarbon resource - both oil and gas**
- **Current development plan maximizes the in-field utility of the gas and does not preclude a major gas sale**

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF THE COMMISSIONER

WALTER J. HICKEL, GOVERNOR

400 WILLOUGHBY AVENUE
JUNEAU, ALASKA 99801-1796
PHONE: (907) 465-2400
FACSIMILE: (907) 586-2754

January 22, 1992

JAN 22 1992

The Honorable Kay Brown
Alaska State Representative
P.O. Box V
Juneau, AK 99811

Dear Representative Brown:

Your note of January 8 to the House Finance Committee included two references I would like to comment on.

- "the production of several billion barrels of oil may be lost if gas sales begin prematurely without compensating measures."

Way over stated and entirely negative in perspective! By the later half of the 1990s (the earliest gas sales can start) there will remain about 2 billion barrels of oil to recover. A maximum change of 10-15% in that recovery might be attributed to leaving lower pressured oil in the reservoir because of greater voidage from gas sales. But, those pressure effects can be mitigated through water injection.

Gas sales will increase the oil production rate and increase recovery of all the gas liquids. Gas sales will also have a positive impact on Prudhoe Bay's field life, which is the major determinant of ultimate recovery.

I agree that the inter-action of gas sales and oil production is a vital issue to be considered during the State's royalty gas sales decision process, but I start from a view that this issue is not a major negative or positive impact.

- "DNR Commissioner Heinze . . . intends to move quickly as possible to sell Prudhoe Bay royalty gas in the Asian market."

I intend at the oversight hearing tomorrow to present my recommendation to use the State's Prudhoe Bay royalty gas to "test" all potential gas markets (including Asia). The proposed RFP would be worked through the multi-year/multi-step regulatory process already in place with legislative and Royalty Board approval decision points.

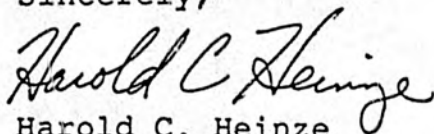
Representative Brown

- 2 -

January 22, 1992

I believe it will take a positive attitude on all our parts if we are to fully understand and achieve the significant potential benefits from North Slope gas sales.

Sincerely,

A handwritten signature in cursive script, reading "Harold C. Heinze".

Harold C. Heinze
Commissioner

cc: Paul Fuhs, Legislative Liaison
Office of the Governor

STATE OF ALASKA

DEPT. OF NATURAL RESOURCES**DIVISION OF OIL AND GAS****WALTER J. HICKEL, GOVERNOR**P.O. BOX 107034
ANCHORAGE, ALASKA 99510-7034
PHONE: (907) 762-2553

(907) 762-2547

January 22, 1992

The Honorable Kay Brown
Alaska State Legislature
P. O. Box V
Juneau, Alaska 99811

Dear Representative Brown:

I apologize for the delay in responding to your inquiry of January 2, 1992 regarding the personnel and budgetary requirements entailed to develop a reservoir model capable of evaluating Prudhoe Bay reservoir performance under a variety of depletion scenarios. However, because of the inherent complexity of such analyses, I thought that it was important to provide you with the independent assessments of the two consultants who advised the division in its recent appearance before the Alaska Oil and Gas Conservation Commission (AOGCC). I have enclosed copies of the responses which we received from Messrs. H.K. van Poolen and Allan Spivak for your review.

I share your personal concern for the proper management of the State's royalty share of oil and gas from the Prudhoe Bay Unit. In fact, that concern was the primary motivation for the division's participation in the hearings before the AOGCC in response to the producers' petition to expand the Prudhoe Bay Miscible Gas Project (PBMGP).

Because of the costs associated with independently replicating the extensive modelling efforts of the producers, I agree with the conclusions of Mr. van Poolen -- that it would be both more efficient and cost-effective to independently analyze the models which have been developed by the producers. As we have discussed previously, however, this presumes a willingness on the producers part to share those data with the division and its consultants, either directly or through the AOGCC, as we urged in the recent hearings.

As you will see from your review of van Poolen and Spivak's responses, the estimated costs of independently modelling the Prudhoe Bay reservoir performance could run in the millions of dollars, and would require a minimum of two years. I personally believe this to be an

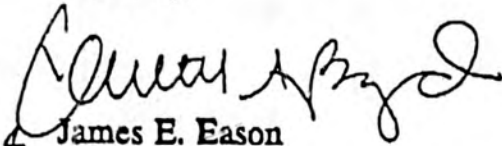
The Honorable Kay Brown

January 22, 1992

Page 2

optimistic estimate, particularly as it relates to the time required. Alternatively, if we are successful in convincing the producers to share their models with us, our costs would be reduced dramatically, ranging perhaps from \$.5 to \$1.0 million. More importantly, the analyses would be available in a much more timely fashion, thus increasing the utility of the information in the State's management of its oil and gas resources.

Sincerely,



James E. Eason
Director

Enclosures

cc: Harold C. Heinze - Commissioner
Bill Van Dyke

PB.ReservoirModel.KB.txt

INTERA WEST

environmental consultants

INTERA WEST • 11444 W. Olympic Boulevard • 10th Floor • Los Angeles, California 90064-1544, USA • Telephone: 213-312-9574 • Facsimile: 213-312-9542

January 6, 1992

Mike Kotowski
State of Alaska
Department of Natural Resources
Division of Oil and Gas
P.O. Box 107034
Anchorage, Alaska 99501

RECEIVED
JAN - 6 1992
DIV. OF OIL & GAS

Dear Mike:

This letter is in response to your inquiry today regarding a model of the Prudhoe Bay reservoir. I am assuming that the purpose of such a model would be to serve as a check on forecasts presented by the operating companies and to answer some of the "big picture" questions that were raised at the recent AOGCC hearings. Examples of such questions are:

- what is the effect of gas cap gas sales on liquids recovery?
- what is the effect of an unanticipated pressure drop on the recovery efficiency of the miscible project(s)?
- what is the effect of injecting gases such as nitrogen or carbon dioxide into the gas cap?
- what are the projected oil and gas production rates for alternative reservoir management scenarios?

Due to the importance of the Prudhoe Bay reservoir to the operating companies, they have expended considerable effort in applying state-of-the-art technology to construct their reservoir models. In order to engage in meaningful dialogue with the operating companies with regard to their reservoir model results, it would be necessary to employ similar technology. This means a compositional simulator with 10,000 to 100,000 grid blocks. This would preclude resurrection of the previous Van Poolen model since it was not compositional and since the simulator used for these previous studies is at least one, and maybe two generations out of date.

It is obviously impossible to come up with a precise cost estimate without an outline of the objectives of the studies to be performed and without a detailed work statement. Notwithstanding this, the minimal effort to set up a state-of-the-art model of Prudhoe Bay would require several person-years of effort plus related software and computer hardware costs. A

considerable portion of the effort would involve processing geologic data to properly characterize the reservoir and history matching past performance.

To give you an idea of the minimal cost and timing, it can be assumed that the equivalent of three person-years of work would be required at a total cost of about \$500,000. (The actual number of persons would probably be more than three and would be a mix of senior engineers, technicians and various levels of personnel between the two). In addition, the software and hardware costs would be on the order of an additional \$100,000 for a total minimum cost of \$600,000.

The elapsed time to set the model up and check it out would be about a year. Even if a concentrated effort were made to accomplish this work in the shortest possible time, the size of the reservoir and the amount of data to be processed would make it difficult to construct the model in less than one year.

You can probably tell by the "roundness" of the above numbers that this is a very rough estimate but, hopefully, it will give you an idea of the amount of effort and related costs that would be involved in constructing a simulation model of the Prudhoe Bay reservoir. You should also be aware that, due to the complexity of the model, running individual cases would not be trivial and it could take a week to make a single run and to analyze the results of that run.

I hope that this brief analysis is of some help. Please do not hesitate to call me if you have any questions or if you would like me to attempt a more detailed cost estimate based on a work statement that we jointly put together.

Yours very truly,

A. Spivak

Allan Spivak

INTERWEST

H.K. VAN POOLLEN

55478 HIGHWAY 285
P.O. BOX 121
SHAWNEE, COLORADO 80475
TELEPHONE 303-838-7168

RECEIVED

JAN 15 1991

DIV. OF OIL & GAS

January 9, 1992

Mr. Michael D. Kotowski
Petroleum Engineer
State of Alaska
Dept. of Natural Resources
Division of Oil and Gas

Dear Mike,

Following your request of yesterday I wish to make a number of comments relative to modeling the Prudhoe Bay Field. During the seventies and early eighties I was involved in modeling the Prudhoe Bay Field. These studies were made on behalve of the State of Alaska Division of Oil and Gas, which is now the Alaska Oil and Gas Conservation Commission. A rather large effort, i.e., a full fledged three-dimensional study, was made with both moral and financial support of the State Legislature. All of these studies were aimed at gross reservoir behavior. These studies had to answer questions such as EFFECTIVENESS OF THE AQUIFER, EFFECT OF GAS SALES ON ULTIMATE RECOVERY, EFFECT OF PRESSURE MAINTENANCE BY MEANS OF REINJECTING PRODUCED GAS AND WATER ON ULTIMATE RECOVERY, AND THE EFFECT OF SOURCE WATER (Arctic Ocean) ON ULTIMATE RECOVERY. In making these studies the State was in a better position to request results of studies by the Operators, the State was in a better position to evaluate these results, and the State (through the Alaska Oil and Gas Conservation Commission) was in a better position to approve operational requests by the Operators.

The software used for these studies was essentially a Black Oil Modeling Program, which means it basically dealt with only three components, i.e. oil, gas and water. The latest version of this program used in these studies is available at the AOGCC.

It should be emphasized that considerable time and effort went into basic data preparation for these studies. A total estimated time for data preparation was 15 man-years with personnel from both my company and the AOGCC. Where the questions to be answered were gross in nature the model could be fairly coarse. Such coarseness allowed for shorter computer times and more generalization of geological data.

During the last eight or so years the emphasis of model studies has drastically changed. Present questions to be answered by the studies is directed toward MISCIBLE INJECTANTS and DROPOUT OR VAPORIZATION OF CONDENSATE IN THE GASCAP, and therefore multicomponent systems. That means that a compositional model program is required which entails many more complexities. Also it requires a finer grid. The purchase of such a program and peripheral programs will have an estimated cost of a quarter million dollars. Computer time to make runs will be very costly and for a single study will equal the cost of the program. The input data will have to be obtained from various laboratory data obtained by the Operators. These data may not necessarily be part of the public domain. After one gets the data they will have

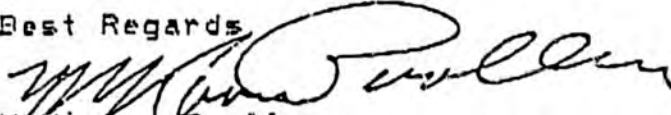
to be checked against equation of state programs. This kind of analyses can easily absorb a man year. Besides the fluid analyses, the geological and well completion data over the last ten to twelve years will have to be brought up to date. I can foresee an overall effort to take twenty man-years over a two year period. That way one may look at a cost on the order of several million dollars.

The problem with this approach is that answers would become available at too late a date. If the answers agree with those of the Operators, not much action is required. If the answers do not agree we would have to enter into a major argument with the Operators which might well be futile in the light of the efforts the Operators have put into these issues.

A MUCH BETTER APPROACH would be for the State to maintain a policing power over the Operators. The only way to maintain such power is to keep Rule 2 but to modify 3600 psi to 3500 psi. At the same time the State should get excess to all laboratory work, and mathematical model studies performed by the Operators, which led to their conclusions and requests. The State should retain a knowledgeable consultant, familiar with the Prudhoe Bay Field, to assist State Petroleum Engineers in the gathering of reports, their analyses and recommendations to the final authority who approves the Operators requests. The cost for such an outside contract should be less than one hundred thousand dollars for the first year and much less thereafter. The State should dedicate at least one of its Petroleum Engineers on a full-time basis.

ALLOWING MODIFICATION OF RULE 2 WILL ALLOW THE OPERATORS TO DO WITH THE FIELD WHATEVER THEY WANT. The present Operators are doing a good job in general. But what will happen if they sold their interest. Then it might be too late for the State to play technical catchup.

Best Regards



H.K. van Poolen

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

WALTER J. HICKEL, GOVERNOR

400 WILLOUGHBY AVENUE
JUNEAU, ALASKA 99801-1796
PHONE: (907) 465-2400
FACSIMILE: (907) 586-2754

January 21, 1992

OFFICE OF THE COMMISSIONER

The Honorable Mike Navarre
Alaska State Representative
P.O. Box V
Juneau, AK 99811

Dear Representative Navarre:

Pardon the delay in answering your question on the potential revenue impact of North Slope gas sales, but it just took a while to get in front of me.

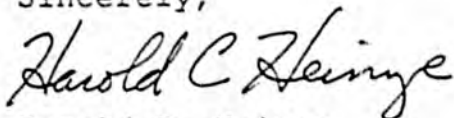
In thinking about the benefits to the State of Alaska in bringing its 3+ TCF of Prudhoe Bay royalty gas to market I have used a range of possible values that looks like this.

<u>Wellhead Gas Price</u>	<u>Daily Sales Volume</u>	<u>State Share</u>	<u>Annual State Revenue</u>
\$.50/MSCF	1.5 BSCFPD	1/8	\$35MM/YR
1.00	2.0	1/5	150
1.50	2.5	1/3	450

The wellhead gas price will remain an item of conjecture until the market is given a chance to speak and will vary over time as other energy prices (predominately oil price) vary. The wellhead gas price is also determined by transportation costs which are driven by construction and operating costs, financing, and throughput volume. The State of Alaska's revenue share may range from a royalty share of 1/8 to an effective 1/3 share based on royalty, severance tax, and corporate income tax elements. Additional revenue to the State results from taxes on the gas production facilities, the investment and profitability of the gas transportation system, and the jobs and general economic increases attributable to the sale of North Slope gas.

I feel that the potential reward of North Slope gas sales is much larger than any other opportunity Alaska has (with the exception of ANWR). I am recommending we proceed down the multi-year/multi-step royalty gas sales regulatory process to fully understand and achieve these significant potential benefits.

Sincerely,



Harold C. Heinze
Commissioner

Representative Navarre

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January 21, 1992

cc: Paul Fuhs, Legislative Liaison
Office of the Governor

The company now says just 31 barrels were lost. There are 42 gallons of oil to the barrel.

As recently as two weeks ago, pipeline manager Bob Williams said as much as 171

frozen pipe burst.

The release was estimated at 1,006 barrels of an oil and water mixture.

The National Oceanic and Atmospheric Administration said that about 40 percent of the oil had been recovered.

very rough estimate, and Kenai Pipe Line agreed.

But DEC environmental specialist Mark Sienkiewicz said Tuesday the agency now thinks only about 16 barrels of oil were picked up

That's 672 gallons.

The agency arrived at the figure after heating the collected oil and water mixture to separate the oil from the water.

Williams said demanding news organizations had

at which enormous quantities of oil were released.

A first guess of the spill's size had been as much as 400 barrels, which is roughly 17,000 gallons.

That would have made it

Please see Page B-3, SPILL

c staff, directors els of fired chief

Post-it brand fax transmittal memo 7671 (9 of pages)

To	Rep. Kay Brown
Co.	Jeff Lawrence
Dept.	VPC
Fax #	465-2278
Phone #	265-3180

Hickel plans to test market for gas

Administration forges ahead despite pipeline setback, industry reluctance

By GEORGE FROST
Daily News reporter

The administration of Gov. Wally Hickel said it will announce today a plan to sell state-owned natural gas from the Prudhoe Bay oil field.

Harold Heinze, commissioner of natural resources, said his plan is to "test all potential gas markets, including Asia," with the state's share of the 30 trillion cubic foot bubble atop the field, the largest in North America. The state of Alaska owns one-eighth of the gas at Prudhoe Bay.

He made the statement in a letter Wednesday to Rep. Kay Brown, D-Anchorage. Heinze did not return telephone calls to discuss his idea and the letter provided few details, but it did say Heinze will discuss the plan today at a joint hearing of the House finance and oil and gas committees.

The plan comes as a surprise to state regulators who must approve or deny it.

"This is all news to me. I don't know what he is saying there," said Dave Johnston, chairman of the Alaska Oil and Gas Conservation Commission, the state agency with the authority to approve

or deny gas sales on the North Slope.

"It sounds like possibly he may be trying to do a gas sale. Or he may be trying to float royalty balloons."

As both private entrepreneur and as governor, Hickel has been the biggest promoter of building an 800-mile gas pipeline from Prudhoe Bay to Valdez, where the gas would be turned into a liquid and exported to Asia. Last month, the governor settled an ethics complaint from a special prosecutor by giving away his stock in Yukon Pacific, the company he founded in the early 1980s to build the gasline. The project has been stymied by the reluctance of the North Slope oil companies to sell gas, and by the reluctance of Japan, Korea and Taiwan to buy it.

Neither Arco Alaska nor BP Exploration (Alaska) — the two biggest North Slope operators — could be reached for comment late Wednesday, but both companies have said recently they don't want to sell any Prudhoe Bay gas before the year 2005, while the Hickel administration has been pushing for sales in the late 1990s.

The oil companies say they

need the gas to inject into the reservoir to maintain pressure to pump oil. Gas is also increasingly used as a oil-dissolving solvent that over the life of the field will free up hundreds of millions of barrels of otherwise unrecoverable crude oil.

In his letter, however, Heinze maintains that selling gas would not substantially hurt oil production. He said that, by the late 1990s, "the earliest gas sales can start," about 2 billion barrels of recoverable oil will remain in Prudhoe Bay. As a result of gas sales, up to 15 percent of that oil might be lost due to "leaving lower pressured oil in the reservoir," he wrote.

Heinze said the pressure loss could be partially made up by flooding the reservoir with water. He said gas sales ultimately would increase the recovery of oil and gas by prolonging the life of the field.

Johnston said the three-member oil and gas conservation commission may schedule public hearings to consider the proposal. He said he doubted selling the state's one-eighth royalty share of the Prudhoe gas would in itself be enough to get the project going.