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Statement of
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Before the
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Hearing on
PROPOSED OIL AND GAS LEASING ON THE OUTER CONTINENTAL SHELF
Northern Gulf of Alaska

Anchorage, Alaska
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THE NEED FOR PETROLEUM SUPPLY FROM THE GULF OF ALASKA

My presentation deals with three questions relating to the potential development of Gulf of Alaska oil and gas resources: is there a basic need for this supply, what are the hazards in delaying the development, and is it desirable to forestall development until a national energy policy is prepared?

THE NEED

Let me begin with the need, which is primarily a national issue. There are five components to the analysis: (1) outlook for domestic oil and gas production from existing sources, (2) the requirements for all energy, (3) the availability of other sources of energy, (4) resulting demand for petroleum, and (5) the implications of relying on foreign oil supplies.

1. Existing Sources

Domestic oil and gas production have both been declining for several years, and combined 1975 production will be down about 10% from the peak output. A downward trend is a near certainty to 1980. Excluding Federal OCS and all Alaskan sources, there is virtually no hope that the slide in production can be arrested thereafter. With early access to every possible resource and adequate incentives, the highest output of oil and gas combined will be no higher in 1985-90 than today. The generally prevailing estimate calls for a reduction of about 15%, or about 25% below the early 1970s peak. These estimates are not exceptional; most of the published projections in the past year or so have been in the same range.

The conclusion is inescapable; Federal OCS production will offset or help to offset, the production decline in old fields; short of accelerating the exporation effort in all frontier areas such as the Gulf of Alaska, there is no way that U.S. oil and gas production will exceed the present level. We are accustomed to thinking that new

supplies imply an increase in total supply available, but this is not the case with U.S. oil and gas production.

2. Energy Requirements

The use of energy is related to the level and characteristics of economic activity. In the past 18 months, beginning with the Arab oil embargo, we have also learned that economic activity can be affected by energy availability.

Our economic projections have been influenced by the energy outlook as well as by the length and severity of the current recession, the degree of inflation in the recent past, the federal deficits and imbalance of payments, and the below normal business investment in this decade. In a deliberately conservative forecast, we estimate the growth rate in real GNP to be only 2.2% per year for 1973-80, but to increase to 3.8% per year in the 1980s. In comparison with the postwar trend through 1973, extrapolated to 1990, $4.6 trillion less GNP will be generated in 1974-90 under this forecast; that is equal to three year's total output at the current size of the economy and part of that loss is attributable to our energy problems.

The nation is using a certain amount of energy to support the present level of economic activity, just as it has in the past and will in the future. The past trend in total energy use per unit of GNP shows a decline at 1.2% per year from 1920 to 1954, but in the postwar period there has been virtually no change; that is, for every percentage increase in GNP, there has been an equal percentage increase in energy. There is no indication of any change in the relationship through the first quarter of 1975. However, we have assumed--again in a deliberately conservative manner--that commencing in 1976 the use of energy per unit of GNP will decline at 0.7% per year, equal to the average rate of change over 1920 to 1974. The decline in the ratio is assumed, in anticipation of price effects combined with the effect of conservation legislation. But there are a number of factors that will tend to offset any improvement in the energy-economic activity relationship:

- More energy is needed for energy intensive growth markets such as fertilizers and petrochemicals.

- More energy is needed for the steel industry, which will expand more rapidly than in the past 10 years.
- More energy is needed because stack gas devices and other means of improving the environment absorbs energy.
- More energy is needed because energy conversion such as coal gasification absorbs a large share of the energy input.
- More energy is needed to save energy, in producing insulation and other energy saving materials.
- More energy per unit of output will be required in energy production and mining in general because of lower grades of deposits in less accessible locations.
- In addition, remember that we are comparing the future with the past relationship in energy use and GNP. Consider the following comparisons:

  -- The power plant heat rate (or efficiency) will improve very little over the next decade, and far less rapidly than in the 1920-60 period. Higher efficiency of new plants tends to be offset by energy absorbed in scrubbers and other environmental equipment. Dieselization of the railroads increased efficiency by several orders of magnitude in the postwar period but that program is completed and future improvement will be limited.

  -- Electric power will continue to increase as a share of total energy. Electric power requires more energy input per unit of output than other energy and as stated, the efficiency is not expected to improve.

  -- The composition of economic activity will change very gradually; Services, generally considered to be non-energy intensive, will not increase as a share of GNP any more rapidly than in the past 20 years during which the energy-GNP relationship changed very little. Services will be adversely affected by the slower future increase in real disposable income and static to declining discretionary income. Moreover, Services in total is already the major component of GNP and by virtue of its large share, a rapid change in share is extremely difficult to achieve.

Combining the conservative economic forecast with an energy-GNP ratio trend that certainly appears conservative in the light of all the above factors, yields a growth rate for energy requirements of only 1.5% per year for 1973-80 and 3.1% per year for 1980-90. The low growth rate in energy use is heavily attributable to a low growth rate in economic activity. A concerted effort to achieve more rapid economic growth can be expected and may well prove to be successful; if so, energy requirements will be higher than forecast above, and this forecast should be viewed as realistic to low.

3. Availability of Other Energy

Nuclear power production is based largely upon scheduled additions through 1985 at least. The scheduled additions have been stretched out and reduced in the past year or two; if anything, the projected reliance on nuclear may be overstated because of further delays and possible cancellations. Nuclear power faces even stiffer resistance from environmentalist groups than does Federal OCS development. As a result, 10 to 13 years may be required from initiation of a nuclear project to initial operation.

Coal, despite its enormous resource base faces many constraints to rapid expansion of productive capacity. Output and use failed to increase in 1974 and there will probably be little increase in 1975. Scheduled additions to capacity amount to about 200 million tons through 1983 versus roughly 600 million tons currently, but as much as half the additions will only offset capacity that will close down because of exhaustion of the deposit or inability to meet Mine Safety Standards or environmental regulations. Additional expansion can be expected by 1983 as well as in 1984-90, but there are limitations to expansion that include environmental limits on sulfur content, delays caused by environmental hearings, problems associated with industrial conversion to coal, water availability for gasification plants, and potential limits to output in the western states that may be imposed by these states. The projected production by 1990, including coal for gasification and for exports, is in excess of 1.2 billion tons. This is not necessarily the upper limit, but it will be difficult to achieve a much greater level of output.

Geothermal capacity operating in 1980 is only that already scheduled, and will be extremely limited. While rather fantastic estimates of operating capacity in 1985 and 1990 have been made by reputable groups, this source of energy is also subject to constraints and extreme uncertainty:

- The level of R&D; the degree of success in such efforts and the timing.
- The success of exploratory activity.
- The location of new deposits in relation to the demand centers for this energy.
- The necessary incremental approach to expansion of capacity in any general location, caused by the unpredictable size of the resource available. In other words it is not practicable to install a large plant, for example, one with a 1,000 megawatt capacity. In Geyserville, a large geothermal resource, each new plant adds only 75 to 125 megawatts of capacity.

Solar energy is in an R&D stage that will last at least five years and probably 15 years or more. According to the FEA, there is at present no market for solar systems because they are not competitive; if they could be sold, manufacturers would provide the systems. For example, manufacture of high temperature solar energy collectors in 1974, at maximum Btu output, was equivalent to only 56 barrels per day of oil, largely financed by various research projects. As in any extensive R&D effort, the outcome and particularly the timing of any degree of success is extremely uncertain. The position taken in this study is that the market for solar systems will evolve gradually, will not commence before 1980, and will probably not be particularly significant until after 1990. To the extent that there is any use in the 1980s, the effect is anticipated in the lower rate of growth in conventional energy demand in the residential and commercial sectors.

4. U.S. Total Demand for Petroleum

After allowing for low economic growth, a steady improvement in the relationship between energy use and economic activity that is a substantial departure from postwar experience and questionable in magnitude,

and the practical availability of all other forms of energy that recognizes all the constraints on these sources, the overall demand for oil and gas combined for 1973-80 is only 0.3% per year, and 1.8% per year for 1980-90, and part of this is coal that has been gasified. But total gas availability from all sources is certain to continue to decline to 1980, and will most probably be lower through the 1980s than at present by 10% or more. The most optimistic assumptions as to deregulation and resource base would yield no higher availability than at the peak in 1973, while the low estimate adopted is not necessarily the lowest that may be realized. To offset the gas decline and meet overall growth in oil and gas requirements, oil demand will increase by several percent per year while domestic production declines.

Thus, the results of this conservative analysis show that, even with the fullest possible access to Federal OCS lands and all other promising hydrocarbon locations throughout the country together with adequate incentives, the nation will have to continue to rely on oil imports of increasing magnitude. Depending on the oil and gas resource base and the inevitable delays in achieving new production in Alaska, imports will increase from 6 million barrels per day currently to 9 to 12 million barrels per day in 1980 and 13 to 17 million barrels per day in 1990. At the present time, the prevailing opinion as to the oil and gas resource base favors the higher estimate of import levels in 1980-90 even though the high import estimates look unrealistic today.

5. Implications of Relying on Foreign Oil

U.S. oil imports from Canada reached a peak of 1.2 million barrels per day and have since declined, with the further Canadian government objective of gradually phasing out exports completely. The oil availability from the rest of the free world (excluding OPEC and related production in the Middle East) is distinctly limited; this portion of the free world is in such a substantial net deficit position on petroleum that the expected increase in local production can do no more than offset, or partially offset, the local increase in demand. Some countries within this category, should substantial oil production be achieved, may also

elect to join OPEC, which is assumed to provide the balance of the required supply; its availability is far from assured.

Based upon a free world energy balance that takes into account the net availability from the Soviet Bloc, the OPEC and related Middle East output is projected to increase from 31 million barrels per day in 1973 and 27 million barrels per day in 1975 to 32 million barrels per day in 1980 and 41 million barrels per day in 1990. This projected OPEC output assumes full availability of Federal OCS and all other U.S. oil and gas as well as nuclear power and other sources of energy. When economists declare that there will be a surplus of energy within the time period of this study, they assume that all of these sources will be available and that there will also be numerous discoveries of supergiant oil fields, but some of the same economists will then argue against the development of Federal OCS resources or other sources of energy. The discovery of supergiant fields, sufficient to alter the historical trend in the finding rate, is basically unpredictable. The past finding rate incorporates discoveries such as in the North Sea and the North Slope; if the future trend in the finding rate is to be substantially higher, such fields will have to be found with increasing frequency. Outside of OPEC, such a prospect is not supported by current evaluations of the resource base.

If new U.S. sources of energy are not made available and the U.S. economic growth projections of this study are not reduced, the need for OPEC production will be that much greater; instead of 41 million barrels per day in 1990, we could face a reliance on OPEC of 58 million barrels per day if OCS production and nuclear power are not permitted. Obviously, the less the U.S. energy production, the greater the world's reliance on OPEC. Extreme reliance on OPEC is not sound policy because of the lack of security of this supply, an already uncertain outlook as to the availability of the quantities required without full U.S. development, and potential economic distortions if the reliance is too extreme.

Of major significance with respect to excessive reliance on foreign oil, is the burden placed on the foreign exchange position of the United States. Sudden price increases by the OPEC in 1973 increased the adverse balance of payments of the United States. The weight of

economic opinion is that the sudden increase had much to do with the severe inflation of 1974. The measures taken to combat that inflation as well as the basic economic distortion induced in turn, have a great deal to do with our present economic recession and high unemployment rate. The more we are dependent on foreign oil the more we are exposed to similar and indeed more severe shocks of the same sort. Gentlemen, the need clearly exists.

DELAYING DEVELOPMENT

The second question to be considered is that of delaying development. When there is a demonstrated need for oil and gas from the Federal OCS now, when there is every indication that the resource exists, when the technology is available to develop the resource, and when industry is considering investing to find and produce the oil and gas, should development be delayed? It has been argued that oil and gas are too precious to use them for their Btu content, and that development of the Federal OCS resources should be delayed until their use can be restricted to such valued uses which are generally characterized as the production of materials (i.e., petrochemicals) as opposed to heat and other forms of energy. It has also been argued that a delay of a few years is necessary for planning purposes.

There are substantial net economic benefits to the development of OCS production. Any delay, even for a few years, cannot be made up later and will reduce those benefits in constant present dollars as well as incurring greater risk of inadequate energy supplies over a longer period of time. There is a high degree of risk involved and the potential consequences are even lower economic growth and higher unemployment than have been incorporated in this study. In evaluating the consequences, rather than isolating the analysis to one source such as the Gulf of Alaska, all challenged new sources should be combined together; the reduced domestic supply of 2 to 7 million barrels per day equivalent in 1985 and 5 to 12 million barrels per day equivalent in 1990 entails high risks amounting to $100-$300 billion (1975 dollars) per year of reduced GNP rising to $250-$600 billion per year by 1990; the related unemployment is in the millions of people, at the extreme in excess of 20 million.

As for the long term delay, the same arguments are applicable. In addition, the concept that oil is too precious to use for thermal value fails to consider the potential use of coal--our abundant energy resource--for the production of chemicals and other materials.

WAITING FOR A NATIONAL ENERGY POLICY

The third question deals with delaying development until a national energy policy has been adopted. But desirable as a national energy policy may be, it cannot alter the basic facts of energy supply and demand described earlier. Energy and economic activity are so interrelated that an energy policy literally requires an economic plan, introducing many uncertainties and extreme controversy. A complete national energy policy may never be developed. In any event, no policy or portion thereof has any chance of acceptance if it is predicated on low economic growth, high unemployment, or no increase in real disposable income. No policy can create onshore oil and gas resources that do not exist, or bring on new resources held back by legal or environmental hurdles, or make new technology and capital instantly available.

The probable elements of a national energy policy have been anticipated in the earlier analysis--conservation legislation, rising real prices for energy, and encouragement in the development of all energy resources. But a policy cannot change the alternatives to Federal OCS development--either greater reliance on oil imports or a lower economic growth rate. Delaying development until a national energy policy is available will help to defeat the potential success of such a plan, because the domestic energy supply is needed now.

CONCLUSION

Developing Federal OCS resources will result in substantial net economic benefits in itself. Additionally, this development will help to support the nation in expanding the economy and creating additional jobs for an already known increase in the labor force. The alternative is lower economic growth and greater unemployment--measured in millions.

These resources should be developed as quickly as possible, in order to arrest a continuous decline in U.S. oil and gas production and to achieve a reasonable regional balance in world oil supplies. There is no economic or energy policy justification for any delay.

(7) pp 7, 10

Testimony of John H. Silcox

Vice President and General Manager - Exploration
Standard Oil Company of California,
Western Operations, Inc.

On Behalf of Gulf of Alaska Operators Committee

At the Department of Interior, Bureau of
Land Management Hearings
On the Draft Environmental Impact Statement
For Outer Continental Shelf Leasing
In the Northern Gulf of Alaska

Anchorage, Alaska - August 12, 1975

My name is John H. Silcox. I am a geologist and Vice President and General Manager of Exploration for Standard Oil Company of California, Western Operations, Incorporated.

My company has been an active oil operator in Alaska since the late 1950's and during my career, I have been pleased to live and work in Anchorage for several years. As a result, and because of my present responsibilities, I am thoroughly familiar with the history and ongoing development of petroleum exploration in Alaska and its offshore waters.

My testimony today is on behalf of the Gulf of Alaska Operators Committee, a 28-member group of oil and gas companies engaged in exploration and environmental studies of the Gulf of Alaska.

Later in this hearing, others will offer statements on virtually every aspect of exploration, development and environmental assessment of offshore areas. They will outline the extensive efforts the oil industry is taking to minimize or eliminate entirely <u>any</u> potentially adverse environmental impact as a result of offshore operations.

My own comments will be limited to a document entitled "OCS Oil and Gas---An Environmental Assessment." This is a report to the President by the Council on Environmental Quality dated April 18, 1974. At this time, I would like to enter into the hearing record a volume entitled "Oil Industry Comments on the CEQ Report."

This volume contains detailed references to various parts of the CEQ Report, far more extensive than I can possibly cover in my brief comments. I urge your careful consideration of these observations.

First, let me say the oil industry recognizes that the CEQ---because of its presidential mandate---had only a short time to prepare its report on what is an exceedingly complex and controversial subject. We also recognize that the Council did not have the benefit of a technical staff with the scientific expertise to produce a definitive study.

Despite this, the CEQ Report has become to some the final "authority" on environmental issues associated with oil and gas operations in the Gulf of Alaska. It is erroneously regarded as a scientifically complete and objective appraisal. And it is often cited as a reference,

especially by those seeking to delay leasing of the Outer Continental Shelf for oil and gas exploration. Unfortunately, it is neither complete nor objective.

Because of this, we believe it is imperative to offer this critique on the CEQ Report and some of its findings. And we appreciate this opportunity to present our views at this hearing.

Our comments are necessarily critical of the report, its lack of scope in certain instances and the false impressions it can convey to the uninformed reader who is not familiar with technical subjects. But we believe our comments are constructive suggestions for improvement. We hope they will be carefully considered in the sincere spirit in which they are offered.

We respectfully request and we trust that our comments and our documented presentation will receive fair and objective consideration in the final Environmental Impact Statement on the Gulf of Alaska.

The CEQ Report does contain a number of constructive recommendations which have been accepted and implemented--- a fact not widely known, especially among oil industry critics.

But those of us who have spent years in oil development and environmental assessment find we must strongly disagree with much of the CEQ Report.

The petroleum industry has spent more than $2 million on numerous scientific studies of the Gulf of Alaska. These studies represent the most comprehensive environmental assessment of the possible impact of oil and gas operations ever conducted in any non-producing area in the world.

This involved years of effort and the talents of some of the most knowledgeable experts ever assembled. The studies were conducted with great care and at great expense. Petroleum industry witnesses appeared and testified extensively at the hearings conducted by the Council.

Yet their testimony, the supporting documentation and the comments made by petroleum industry witnesses were given little consideration. In fact, this mass of material and expert comment was <u>virtually ignored</u> in the final report.

As a result, the CEQ Report falsely implies that oil and gas development in the Gulf of Alaska is an unreasonably high environmental risk operation. Yet if this factual data had been reflected properly in the final draft, we believe it would clearly demonstrate the shortcomings of the CEQ Report and offset this false impression.

One conclusion in the CEQ Report which greatly concern the petroleum industry is the arbitrary "ranking" of the 17 OCS areas in terms of environmental "risk." The report purpor to classify the Gulf of Alaska as a high environmental risk for oil and gas exploration.

Apparently, this "ranking" is based on three general concerns: Oceanographic conditions, seismic hazards and the Gulf of Alaska's geographic location---an area of major ecological interest.

In all development by man, whether of oil or any other commercial endeavor, there is some degree of environmental risk. Yet in evaluating this potential risk, great care must be made to clearly distinguish between real threats to the environment and subjective judgments that simply prohibit any proposed development.

If this had been done, we do not believe oil exploration in the Gulf of Alaska could reasonably be classified as an area of high environmental risk.

Even the term "risk" must be properly defined if it is to offer any meaningful assistance to an environmental assessment of the Gulf of Alaska. Nowhere was this done in the CEQ Report.

Everyone here "risked" the prospect of being hit by a falling meteorite on the way to this hearing. Yet the probability of being struck by a falling meteorite is so remote that this particular "risk" is almost non-existent.

By failing to make such measured distinctions, the CEQ Report leaves a clear impression that anything labeled as a "risk" must indeed be "risky" or even unacceptably "hazardous."

This is simply not true.

To rank the Gulf of Alaska on the high end of an environmental risk scale and the Eastern Georges Bank at the low end is an arbitrary judgment. It totally ignores the fact that for both areas, based on past oil industry experience, there is a very low probability of any major or permanent environmental damage from drilling and production activity.

Furthermore, to be useful, the concept of "risk" of environmental damage must be considered on a larger scale of risk evaluation---giving proper weight to all available options the U.S. has to develop the additional energy it must have. Everyone is well aware of the potential long-term energy crisis confronting the United States.

We import 40 per cent of the petroleum we use and the gap between domestic production and demand grows wider each year. It aggravates the balance of payments problem; it seriously impairs the nation's ability to recover from the worst recession since World War II. Increased dependency on foreign sources of petroleum is clearly not in the national interest. Because of this, it is the declared policy of the Federal government to encourage and hasten domestic oil exploration, particularly in the promising offshore areas.

Chronic long-term energy shortages could cause widespread unemployment and severe hardships that would create massive social and economic problems. Clearly, the "risk" of exploring for oil in the OCS is more than offset by the economic risk of not vigorously trying to become more self-sufficient in energy.

Viewed in this context, as part of the overall economic, ecological and social environment, any reasonable observer must conclude that oil and gas exploration offshore, including the Gulf of Alaska, is clearly acceptable and necessary.

Too often, excessive environmental restrictions have simply ignored economic needs. The delay in the Alaska pipeli project is an example. Yet, to the individual citizen, a job, a paycheck and energy to heat and light his home and fuel to run his car are critically important. They are part of his total environment, and must be considered, too.

Major Short-Comings of CEQ Report

Because of limited time, I will briefly outline the major shortcomings we find with the CEQ Report. But I will be happy to respond to any questions at the conclusion of this summary.

First, the CEQ Report gives little notice to the sweeping technical advances the oil industry has achieved in offshore drilling the past 25 years. It virtually ignores the research programs carried out in the Gulf of Alaska by the petroleum industry, the testimony we presented, and the several boxes of documentation entered into the record. The final report contains only one or two minor references to this research.

By way of contrast, the environmental community offered rhetoric rather than scientific fact, and yet their philosophy permeates the entire fabric of the CEQ Report.

The U.S. industry leads the world in petroleum technology. It has explored, found and developed almost all the Free World's oil reserves, including the latest major offshore area---the North Sea. Except for seismic activity, environmental conditions in the North Sea are slightly more severe than in the Gulf of Alaska.

Yet the oil industry has constructed offshore platforms, drilled, and placed sub-sea pipelines into operation. Today, the North Sea is producing oil and gas with no significant detrimental impact on the marine environment.

The result has been tremendously beneficial for the economic environment of neighboring nations. The United Kingdom expects to be self-sufficient in oil and gas in the early 1980s and Norway plans to become an oil exporter. Previously, both those nations had been almost totally dependent on foreign oil.

Secondly, a disturbing part of the CEQ Report is the superficial treatment it gives to complex technical subjects, with insufficient documentation. The report uses language which exaggerates and overstates potential environmental damage.

The use of such words as "devastate," "chaos," and "massive changes" in describing the potential impact of oil operations strongly suggests a bias against petroleum development and clearly demonstrates a lack of scientific objectivity in assessing environmental questions.

In many instances, the overall impression given by the report is a wholly unwarranted skepticism toward the oil industry and its sincere and positive efforts to act responsibly, to fully comply with all environmental safeguards.

Thirdly, great emphasis is placed on the spill trajectory probability forecasts conducted by the Massachusetts Institute of Technology. Yet the MIT calculations are misleading in several crucial respects.

They make no allowance for the established fact that oil spilled in the ocean evaporates, biodegrades, emulsifies and disperses---within relatively short periods of time---so any spill is diluted to a degree that harmful effects are eliminated or greatly minimized.

Nor do the MIT calculations allow for the fact that the industry makes every effort to contain and prevent spilled oil from coming ashore. Indeed, Federal regulations already require equipment and containment plans in all offshore producing areas.

Fourth, the CEQ Report grossly overstates the effect that oil operations in the Gulf of Alaska will have onshore, both here and in the Lower 48 states.

For example, the CEQ predicts that more refineries and petrochemical plants will be required on the West Coast because of OCS oil. This is untrue. The growth of refineries is caused by demand for refined products in a particular region, not by the presence or absence of oil production. The production of OCS oil will simply substitute domestic oil for part of the foreign crude now being processed by West Coast refineries.

The only significant onshore effects will be from those required to support offshore operations---including boat landings, heliports, staging areas, offices and possibly oil and gas treating facilities. Even this may not be required in all cases because it may be an advantage to store and ship some oil from offshore facilities.

Fifth, in another reference, the report mentions potential health hazards and makes mathematical forecasts of additional hydrocarbon emissions near U.S. refineries. But it does not document this finding.

If it had, the authors would have discovered that in areas they mentioned, hydrocarbon emissions from refinery operations are strictly controlled now---by rigid state, local and Federal regulations. Clearly, this type of undocumented and incomplete presentation to a non-technical audience imparts an exaggerated and erroneous impression of onshore effects of OCS oil development.

The CEQ Report could have been more useful and accurate if it had studied these subjects in more depth and if it had at least considered the testimony by the petroleum industry.

But there is one onshore impact mentioned by the CEQ with which we do agree: OCS oil production will provide substantially increased employment opportunities---in the Lower 48 and in Alaska.

Sixth, I must criticize the Council's superficial discussion of natural phenomena and the design technology that has been developed to minimize problems caused by natural phenomena.

Other witnesses will discuss these topics in detail, including oceanographic conditions, the effect of winds and waves, earthquakes and design practices. Here again, the CEQ has ignored the considerable factual data and information presented by the Gulf of Alaska Operators Committee. In several instances, ocean conditions presented by the oil industry differed from those cited by the CEQ. But the Council did not list its sources, nor the geographic location of the data it cites.

There are several misleading statements on the oil industry's technical ability. An example: An uninformed reader scanning the CEQ Report would get the clear impression that modern engineering is incapable of designing structures to withstand earthquakes. But such structures are being constructed in active seismic zones throughout the world.

Further, in discussing offshore operations, the report should have noted that the farther away you get from an earthquake fault or epicenter, the less potential there is for damage or even ground motion.

Much of the lease sale area in the Gulf of Alaska is located sufficiently distant from significant faults that the potential for severe ground motion is sharply reduced.

The report should have at least acknowledged that millions of people in the world live in active seismic regions---in Japan, California, Alaska, down the West Coast of South America and into the Middle East. To suggest that development of any kind should be prohibited in these areas because of seismic hazards is absurd. What is needed is to design structures to withstand and minimize potential damage. That is already being done in the U.S.

Seventh, the discussion of tsunamis in the Council's report also leaves a reader a false impression of their overall severity and potential for damage. The main threat from wave actions caused by seismic activity is to onshore installations---berthing facilities, docks and things of this sort. This is recognized.

But in the open sea---where much of the oil operations in the Gulf of Alaska would take place---the impact of most tsunamis would probably go unnoticed.

The Council's report makes only passing reference to the oil industry's technological accomplishments in Cook Inlet where since the early 1960's, when petroleum production activities commenced, there have been no serious structural failures or damaging oil spills.

Drilling platforms in Cook Inlet have withstood year batterings by 3 to 4 feet of ice moving at five knots or better, and tides whose range is among the highest in the world. These platforms have also experienced an earthquake measured at a magnitude of 6.5 on the Richter scale.

Eighth, as a final item of this critique, we believe the CEQ Report should have placed more importance on the oil industry's experience in offshore drilling in the Gulf of Mexico. The industry has drilled and produced offshore in the Gulf of Mexico for a quarter of a century. There has been extensive operations in all weather, even under storm conditions in an area noted for hurricanes. Yet the oil, fishing and other industries have operated harmoniously together over all that period of time.

There has been no evidence of lasting harm to the environment nor to marine life from offshore oil operations.

The Offshore Ecology Investigation conducted by Gulf Universitie Research Consortium contains factual data on the ecological health of the Gulf of Mexico. Despite this documentation, this harmonious operation of the oil industry with fishing and other marine activities is not reflected in the CEQ Report.

In summary, we believe many parts of the CEQ Report give an imprecise picture of the Gulf of Alaska environmenta assessment, a false picture of the industry's ability to design safe structures for the Gulf of Alaska, and an erroneous impression of the onshore impact of leasing OCS lands in the Gulf of Alaska.

The oil industry believes its input to the CEQ Report was not adequately considered or reflected.

With this presentation and the written documentation we have offered, the industry has tried to put the CEQ Report in its proper perspective.

We earnestly trust that the testimony being presented here today will be seriously considered and evaluated by those who prepare the final Environmental Impact Statement---and by those in the decision-making process regarding OCS leasing for the Gulf of Alaska.

Thank you. If anyone has any question----

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Oil Industry Comments
on the CEQ Report

July, 1975

(14)

STATEMENT OF SAM L. DEMMERT

PRESIDENT

YAK-TAT-KWAAN, INC.

PRESENTED AT

HEARING ON DRAFT ENVIRONMENTAL STATEMENT

PREPARED BY

DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
OUTER CONTINENTAL SHELF
NORTHERN GULF OF ALASKA

AUGUST 12, 1975

GENTLEMEN, I AM PLEASED TO HAVE THE OPPORTUNITY TO APPEAR BEFORE YOU TODAY AND PRESENT OUR VIEWS ON THIS IMPORTANT SUBJECT DEALING WITH THE OUTER CONTINENTAL SHELF.

I AM THE PRESIDENT OF YAK-TAT-KWAAN, INC. WHICH IS THE VILLAGE CORPORATION OF YAKUTAT FORMED UNDER THE ALASKA NATIVE CLAIMS SETTLEMENT ACT. OUR STOCKHOLDERS MAKE UP WELL OVER ONE-HALF OF THE TOTAL POPULATION OF YAKUTAT -- BOTH INSIDE AND OUTSIDE THE CITY.

WE HAVE REVIEWED THE DRAFT ENVIRONMENTAL IMPACT STATEMENT PREPARED BY THE BUREAU OF LAND MANAGEMENT, DEPARTMENT OF THE INTERIOR ON THE OUTER CONTINENTAL SHELF, NORTHERN GULF OF ALASKA. THIS IS A VOLUMINOUS DOCUMENT OF ALMOST 1,000 PAGES. WE FIND IT MOST DIFFICULT IN THE RELATIVELY SHORT TIME AVAILABLE TO DETERMINE FROM THIS STATEMENT THE EXACT IMPACT ON THE YAKUTAT COMMUNITY IN AS MUCH AS ALL DATA FOR COASTAL COMMUNITIES ARE "LUMPED" TOGETHER. THE MANY PAGES OF STATISTICAL DATA ARE NOT RELATED IN PRACTICAL TERMS TO THE FACILITIES AND SERVICES NEEDED FROM THE PUBLIC AND PRIVATE SECTORS IN EACH COMMUNITY. SOME OF THE CONCLUSIONS ARE SO FAR FROM WHAT WE BELIEVE TO BE REALISTIC THAT THE CREDITABILITY OF OTHER SECTIONS OF THE STATEMENT ARE OPEN TO QUESTION. THIS IS PARTICULARLY TRUE IN THE LIGHT OF THE OIL

INDUSTRY STUDY ON SOCIAL AND ECONOMIC IMPACT DONE BY MATHEMATICAL SCIENCES NORTHWEST, INC. FOR THE GULF OF ALASKA OPERATORS COMMITTEE.

WE ARE ATTACHING TO THIS STATEMENT A COMPARISON OF A SUMMARY OF SOCIAL AND ECONOMIC DATA TAKEN FROM THE MATHEMATICAL SCIENCES REPORT AND THE DEPARTMENT OF INTERIOR'S DRAFT ENVIRONMENTAL STATEMENT. WE NOTE THAT THE GREATER EMPHASIS IS PLACED ON THE ANALYSIS OF THE LOWER OIL PEAK PRODUCTION ASSUMPTION OF 550,000 BARRELS PER DAY, ALTHOUGH AN ASSUMPTION AS HIGH AS 1.5 MILLION BARRELS PER DAY IS QUOTED. HOWEVER, FROM THE STANDPOINT OF EVALUATING THE IMPACT ON THE COASTAL COMMUNITIES WE FIND IT MORE DISTURBING TO LEARN THAT THE DEPARTMENT OF THE INTERIOR FEELS THERE WILL BE ONLY ONE ONSHORE TERMINAL FACILITY AND THREE OFFSHORE, WHILE THE GULF OF ALASKA OPERATORS COMMITTEE STATES THERE WILL BE A NEED FOR TWO ONSHORE AND NONE OFFSHORE. SIMILARLY, THE NUMBER OF OIL AND GAS FIELDS IS LISTED AS FIVE (WITH A MAXIMUM OF TEN) BY THE COMMITTEE AND TWELVE BY THE DEPARTMENT'S FORECAST. THE NUMBER OF PLATFORMS VARIES FROM 15 IN THE COMMITTEE'S ESTIMATE TO 22 IN THE DEPARTMENT' STATEMENT.

ALTHOUGH YAKUTAT IS LISTED AS ONE OF THE THREE LIKELY PRIMARY SUPPORT/SUPPLY BASES BY THE DEPARTMENT OF INTERIOR IN ITS STATEMENT THE ESTIMATED POPULATION INCREASE IS ESTIMATED

AT SLIGHTLY OVER 100 PEOPLE. WE FIND THIS AN INCREDULOUS CONCLUSION. IN THE SAME STATEMENT THE 1974 CEQ REPORT OF THE "HIGH DEVELOPMENT CASE" OF "AN INDUCED POPULATION OF OVER 4,000" IS DISCUSSED. YET, THERE IS NO EXPLANATION FOR THESE EXTREME VARIANCES IN POPULATION ESTIMATES (100 COMPARED TO 4,000) BY TWO FEDERAL AGENCIES. THIS MAKES IT DIFFICULT FOR ANY ONE TO PLACE A GREAT DEAL OF CONFIDENCE IN THIS DRAFT ENVIRONMENTAL STATEMENT MUCH LESS USE IT AS A BASIS FOR PLANNING INVESTMENTS BY EITHER THE PUBLIC OR PRIVATE SECTORS.

WE HAVE CITED SOME ALARMING DISCREPANCIES BETWEEN THE DEPARTMENT OF INTERIOR'S DRAFT ENVIRONMENTAL STATEMENT AND THE OIL INDUSTRY'S STUDY AND REPORT ON THE POTENTIAL SOCIAL AND ECONOMIC IMPACT. WE BELIEVE THESE DIFFERENCES SHOULD BE STUDIED AND RECONCILED. WE ALSO BELIEVE THAT SPECIFIC DATA SHOULD BE DEVELOPED FOR EACH COASTAL COMMUNITY AND THAT THIS DATA SHOULD BE RELATED IN A PRACTICAL SENSE TO EACH COMMUNITY. FOR EXAMPLE, THE NEED FOR SUPPORT/SUPPLY FACILITIES INCLUDING SUCH THINGS AS DOCKS AND STORAGE AREAS SHOULD BE IDENTIFIED AND RELATED TO COMMUNITY FACILITIES, PUBLIC UTILITY AND OTHER SERVICES NEEDED. ONCE THE "NEEDS" ARE IDENTIFIED THE ABILITY OF THE PUBLIC AND PRIVATE SECTORS IN EACH COMMUNITY TO SUPPLY THESE NEEDS SHOULD BE ANALYZED AND SOLUTIONS OFFERED WHERE THE COMMUNITY IS UNABLE TO MEET THE NEEDS.

IN ADDITION, I WAS RECENTLY SURPRISED TO READ IN THE JULY 1975 ISSUE OF THE MAGAZINE "ALASKA" THAT THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION HAS JUST STARTED A 4-5 YEAR STUDY PROGRAM TO ESTABLISH BASELINE DATA IN THE GULF OF ALASKA FOR DETERMINING THE IMPACT OF OIL DEVELOPMENT ON THE ENVIRONMENT. HOWEVER ONCE THE LEASE SALES ARE HELD THE STUDY CANNOT CONCLUDE THAT THE SALE SHOULD NOT BE HELD OR SHOULD BE DELAYED. SO ONE BASIC POSSIBLE CONCLUSION FROM THE STUDY IS FORECLOSED BEFORE THE STUDY IS EVEN MADE.

IN GENERAL WE FEEL THE DEPARTMENT OF INTERIOR DOES NOT HAVE SUFFICIENT INFORMATION TO ACCURATELY PROJECT THE ENVIRONMENTAL IMPACT OF LEASING IN THE GULF OF ALASKA.

AS PREVIOUSLY STATED WE HAVE HAD TO CONDUCT OUR OWN STUDIES AND ATTEMPT TO PLAN FOR THE FUTURE IMPACT OF OCS DEVELOPMENT. HOWEVER WE NEED MORE TIME TO DO A PROPER JOB AND THEREFORE WE FEEL OUR REQUEST FOR RE-SCHEDULING THIS SALE IS JUSTIFIED.

GENTLEMEN, I WANT TO MAKE IT ABSOLUTELY CLEAR, FOR YOU, FOR THE PRESS, AND FOR OTHERS PRESENT HERE, THAT OUR CORPORATION DOES NOT FLATLY OPPOSE THE DEVELOPMENT OF THE GULF OF ALASKA OCS OIL POTENTIAL. IF THAT DEVELOPMENT IS

PROPERLY DONE, THE GULF COASTAL COMMUNITIES CAN PROSPER AND BENEFIT FROM THE ONSHORE DEVELOPMENT. WE RECOGNIZE THAT OUR COUNTRY NEEDS THE OIL AND GAS RESOURCES THOUGHT TO BE DEEP IN THE GULF -- BUT -- CANDIDLY, WE'RE NOT WILLING TO SEE OUR YAKUTAT LAID BARE UNDER THE ONSLAUGHT OF DEVELOPMENT.

WE BELIEVE THAT DEVELOPMENT AND PRESERVATION OF THOSE THINGS WHICH ARE IMPORTANT TO US IN YAKUTAT ARE COMPATIBLE -- THAT YAKUTAT CAN BENEFIT FROM THE GULF OF ALASKA OCS DEVELOPMENT IF THAT DEVELOPMENT COMES ABOUT UNDER STRICT CONTROL AND IN THE PLACES LOCAL PEOPLE WANT IT -- IF THAT DEVELOPMENT IS MADE TO CONFORM TO THE WANTS AND WISHES OF LOCAL PEOPLE RATHER THAN LOCAL PEOPLE HAVING TO ADJUST AND CHANGE TO ACCOMMODATE THE DEMANDS OF THE DEVELOPMENT.

OUR CORPORATION HAS SPENT THOUSANDS OF DOLLARS IN THE PAST YEAR DEVELOPING A LAND USE PLAN. WE'VE CONSIDERED IT -- FROM THE PHYSICAL, ECONOMIC, SOCIAL AND LAND USE POINTS OF VIEW. AND WE'RE ABOUT TO SPEND MORE DOLLARS TO CONSIDER IT FURTHER. AND WE HAVEN'T RULED OUT ONSHORE DEVELOPMENT BY ANY MEANS. ON THE CONTRARY, WE'RE PROPOSING TO DEVELOP ONSHORE FACILITIES TO SERVICE THE OCS DEVELOPMENT. THE CITY AND OUR CORPORATION ARE WORKING CLOSELY TOGETHER IN THESE EFFORTS, AND WE INTEND TO CONTINUE WORKING TOGETHER TO

ASSURE THAT THE PEOPLE OF YAKUTAT BENEFIT FROM THE DEVELOPMENT RATHER THAN PAY THE PRICE AS HAS BEEN THE CASE IN SO MANY OTHER COMMUNITIES. AND -- IT'S IMPORTANT TO NOTE THAT THERE ARE TWO REASONS WHY WE'RE DOING THESE THINGS:

1. THERE ARE OBVIOUS ECONOMIC BENEFITS TO THE COMMUNITY AND TO THE CORPORATION FROM ENTRY INTO THIS AREA:

2. AND, WE SEE OUR DEVELOPING OF ONSHORE SUPPLY AND SUPPORT FACILITIES AS THE ONLY MEANS WHEREBY LOCAL CONTROL OF THAT DEVELOPMENT CAN BE ACHIEVED.

WITHOUT THAT LOCAL CONTROL -- WITHOUT THE ABILITY TO DECIDE WHAT LAND USES ARE GOING TO BE LOCATED WHERE -- WITHOUT THE ABILITY TO POLICE THAT DEVELOPMENT -- OUTSIDE INTERESTS -- LAND SPECULATORS AND MAJOR OIL INTERESTS FROM HOUSTON AND DENVER, WILL MAKE THE DECISIONS AND YAKUTAT PEOPLE WILL BENEFIT NOTHING IN THE WAY OF JOBS AND INCOME. WITHOUT THAT LOCAL CONTROL YAKUTAT WILL EXPERIENCE A PROLIFIRATION OF UNCONTROLLED, INDISCRIMMINATE AND IMPROPERLY LOCATED DEVELOPMENT. INSTEAD OF ONE MAJOR FACILITY WHICH THE COMMUNITY CAN ALSO USE TO MEET ITS SHIPPING NEEDS, AND A PLANNED INDUSTRIAL AREA, MONTI BAY WILL BE LINED WITH TEMPORARY DOCK FACILITIES -- EACH OIL COMPANY OWNING AND OPERATING ITS SEPARATE FACILITY -- AND YAKUTAT WILL END UP LIKE KENAI,

ALASKA, WHERE, AFTER ALL WAS SAID AND DONE IN THE COOK INLET OIL AND GAS DEVELOPMENT THAT COMMUNITY STILL, TODAY, DOESN'T HAVE A LOCALLY OWNED DOCK FACILITY TO MEET LOCAL NEEDS.

IF THE SALE GOES FORWARD IN DECEMBER OF THIS YEAR THE COMMUNITIES WILL NOT BE PREPARED; SHORTAGES OF ALL TYPES WILL EXIST; OIL COMPANIES WILL GO THEIR SEPARATE WAYS AND BUILD FACILITIES TO MEET THEIR IMMEDIATE INDIVIDUAL NEEDS WHEREVER THEY CAN OBTAIN LANDS ONSHORE; AND THE LONG TERM NEEDS OF BOTH THE INDUSTRY AND COMMUNITY WILL NOT BE MET. THEREFORE, WE URGE A MORE THOROUGH EVALUATION OF THE DATA IN THIS ENVIRONMENTAL STATEMENT AND THE RE-SCHEDULING OF THE OIL AND GAS LEASE SALE.

IF FUNDS WERE AVAILABLE TODAY THE MINIMUM PERIOD NEEDED FOR LOCAL PLANNING AND IMPLEMENTATION OF SUCH PLANS IS TWO YEARS. FOR THIS REASON WE HAVE SUPPORTED THE POSITIONS OF THE CITY OF YAKUTAT AND STATE ADMINISTRATION FOR A RE-SCHEDULING OF TWO YEARS BEFORE HOLDING THE NORTHERN GULF OF ALASKA SALE.

PROPOSED 1975 OIL AND GAS LEASING

IN

NORTHERN GULF OF ALASKA

SUMMARY OF SOCIAL & ECONOMIC DATA - THIS SALE ONLY

	MATHEMATICAL SCIENCES NORTHWEST INC.	U.S. DEPARTMENT OF INTERIOR BLM
DATE OF HEARING ON INTERIOR IMPACT STATEMENT		AUGUST 12, 1975
PROPOSED DATE OF SALE		DECEMBER, 1975
SALE ACREAGE OFFERING		1.8 MILLION ACRES
ANTICIPATE SALE		1.4 MILLION ACRES
TOTAL PRODUCTIVE ACRES		650,000 ACRES
OIL & GAS FIELDS	5	12
MAXIMUM NUMBER	10	
AVERAGE DISTANCE OF OIL FIELDS FROM SHORE	25 MILES	22 MILES
AVERAGE DISTANCE FROM SHORE BASES	50 MILES	
RECOVERABLE OIL (5% PROBABILITIES)		2.8 BILLION BBLS.
RECOVERABLE GAS (5% PROBABILITIES)		9 TRILLION CU. FT.
PEAK PRODUCTION OIL - DAILY	550,000 BBLS/DAY (1.5 MILLION BBLS/DAY)	550,000 BBLS/DAY
ANNUALLY		200 MILLION BBLS/YR.
PEAK PRODUCTION GAS - DAILY		1.0 BILLION C.F./DAILY
ANNUALLY		365 BILLION C.F/YEAR
PLATFORMS	15 (3 PER FIELD)	22
WELLS		900

	MATHEMATICAL SCIENCES NORTHWEST INC.	U.S. DEPARTMENT OF INTERIOR BLM
PIPELINE		12 TO 24
TOTAL MILES OF PIPELINE		300 (50 ONSHORE, 250 OFFSHORE)
PIPELINE BURIAL EXCAVATION VOLUME		.9 TO 2.4 MILLION CU. FEET
OFFSHORE TERMINAL FACILITIES	0	3
PIPELINE ACREAGE REQUIRED		175 ACRES
ONSHORE TERMINAL FACILITIES	2*	1 (120 ACRES)
SUPPORT SUPPLY FACILITIES	2***	8 (640 ACRES)***
LNG PLANT	1*****	1 (120 ACRES)
ONSHORE LAND REQUIREMENTS		1,055 ACRES
PETROLEUM REFINERIES	0	0
SERVICING FLEET (BOATS & SHIPS)		20 TO 60
ANNUAL CRUDE OIL SHIPPED BY TANKER		200 MILLION BBLS/YR
EXPLORATORY DRILLING WOULD START	1976	ONE YEAR AFTER SALE
" " " CONTINUE	1985	11TH YEAR
" " " PEAK	1979-80	1979-80
LIFE OF OIL & GAS FIELDS		25 YEARS
ELAPSED TIME FOR OIL & GAS FIELDS		40 YEARS

* LIKELY TO BE LOCATED SOME DISTANCE FROM ANY COMMUNITY. ONE TO BE STARTED IN 1979, AND ONE TO BE STARTED IN 1981, WITH TWO YEARS REQUIRED TO BUILD EACH FACILITY.

*** MATHEMATICAL SCIENCES STATES YAKUTAT AND CORDOVA ARE PRIMARY SUPPORT/SUPPLY CENTERS. INTERIOR STATES THAT POTENTIAL SUPPORT/SUPPLY ACTIVITIES WILL BE CONDUCTED IN YAKUTAT, YAKATAGA, MIDDLETON ISLAND, CORDOVA, SEWARD, ANCHORAGE, KENAI, AND VALDEZ, BUT CORDOVA, YAKATAGA AND YAKUTAT ARE CONSIDERED PRIMARY BASES.

::::: PRODUCTION OF 300 MILLION CUBIC FEET OF GAS DAILY OVER 7-10 YEAR PERIOD AT CURRENT PRICES IS REQUIRED TO MAKE LNG PLANT FEASIBLE. 55-60 MILLION CUBIC FEET DAILY IS REQUIRED FOR A PRILLED UREA OR ANHYDRODUS AMMONIA PLANTS. LNG FACILITY WOULD REQUIRE 30 MONTHS TO BUILD WITH AVERAGE CONSTRUCTION WORK FORCE OF 350, AND PEAK FROM 400 TO 500; AND 25 TO 35 IN PERMANENT WORK FORCE AND 65 INCLUDING INDUCED EMPLOYMENT. UREA OR AMMONIA PLANT WOULD REQUIRE 30 MONTHS TO BUILD WITH AVERAGE CONSTRUCTION WORK FORCE OF 200 AND PEAK OF 300; AND PERMANENT WORK FORCE OF 200, OR 372 WITH INDUCED EMPLOYMENT.

EMPLOYMENT & POPULATION INCREASES
MATHEMATICAL SCIENCES ONLY
CASE B

YEAR 1976 -	DIRECT	291
	INDIRECT AND INDUCED	541
	TOTAL	832
YEAR 1980 -	DIRECT	1,486*****
	INDIRECT AND INDUCED	2,764
	TOTAL	2,534
YEAR 1985 -	DIRECT	886
	INDIRECT AND INDUCED	1,648
	TOTAL	2,534

STATEWIDE POPULATION INCREASE - CUMULATIVE

1976	1,633
1980	8,444
1985	5,148

COASTAL COMMUNITIES POPULATION INCREASE - CUMULATIVE

1976	59
1980	700
1985	1,302

***** IF MAXIMUM DAILY PRODUCTION OF 1.5 MILLION BBLS. OF OIL IS REACHED, EMPLOYMENT IN 1981 WOULD BE 2,342 WHICH IS 48.5% GREATER THAN IT WOULD BE WITH DAILY PRODUCTION AT 360,000 BBLS.

EMPLOYMENT & POPULATION - INTERIOR, BLM ONLY

ESTIMATED SALE INDUCED POPULATION

YEAR	TOTAL WORKFORCE	TOTAL POPULATION
1975	0	
1976	0	
1977	0	
1978	152	348
1979	152	348
1980	1,440	3,297
1981	2,510	5,748
1982	3,128	7,163
1983	4,501	10,307
1984	5,016	11,487
1985	4,595	10,522
1986	3,449	7,898

NOTE: POPULATION IS ANTICIPATED TO REMAIN AT THE 1986 LEVEL DURING LIFE OF PRODUCTION.

POSSIBLE DISTRIBUTION OF POPULATION

	TOTAL	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1978	348	.278	3	31	21	3	6	6
1980	3,297	2,604	33	297	198	33	66	66
1985	10,522	8,134	105	947	631	105	210	210
1986	7,898	6,239	79	711	474	79	158	158

(1) ANCHORAGE (2) CORDOVA (3) KENAI (4) KODIAK (5) YAKUTAT (6) SEWARD (7) VALDEZ

20

STATEMENT OF

A. D. MOOKHOEK
EXXON COMPANY, U.S.A.

before the

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HEARING

on

PROPOSED OIL AND GAS LEASING

on the

OUTER CONTINENTAL SHELF

NORTHERN GULF OF ALASKA

ANCHORAGE, ALASKA
AUGUST 12-13, 1975

PRESENTATION FOR ENVIRONMENTAL HEARING
GULF OF ALASKA OFFSHORE SALE
A. D. Mookhoek

My name is Bram Mookhoek. I am the Ocean Operations Manager for the Marine Department, Exxon Company, U.S.A., and during my 27 years in the company have been associated with all areas of marine transportation including the technical, economic and operational aspects. I might mention at this time that I am also chairman of the Marine Services Subcommittee of Alyeska, which is a group representing the Owner companies in marine matters. In this capacity, I work closely with the U. S. Coast Guard on routing of tankers to and from Valdez, navigation aids, anchorage areas in Prince William Sound, vessel traffic system, etc. Some or all of these aspects will also apply to the Gulf of Alaska marine operations.

In my discussion today, I will cover two subjects: (1) marine transportation, and (2) terminals.

In the marine transportation area, we will first look at the ships. For obvious reasons, we are, at this time, in no position to determine the size tanker to be used since this is a function of the crude production and the location of the terminal. However, to place this in better perspective, we have prepared this slide which shows, for various ship sizes and at different production levels, the number of port calls which would occur. This tabulation shows that a 45,000-ton tanker with a draft of 39 feet and a carrying capacity of 325,000 barrels of crude at a production level of 120,000 barrels per day will be arriving at the terminal about once every 3 days, while a 120,000-ton vessel having a draft of 52 feet and carrying about 860,000 barrels will arrive once every 7 days. Of course, if the production is greater than 120,000 barrels per day, port calls will increase correspondingly, as indicated by the number to the right of the third column.

It should be pointed out that the ship sizes shown here are arbitrarily selected and do not imply the actual size to be used. However, I believe it can generally be accepted that vessel size increases as production levels become higher.

Some of the sizes shown here are for existing vessels in the U. S. fleet, while others are new construction. Assuming that crude will be shipped to the U. S. West Coast, only vessels built in the U. S. and manned by U. S. crews will be permitted, because the Jones Act prohibits use of foreign flag vessels in U. S. domestic trades. U. S. ships are built to standards established by the American Bureau of Shipping and maintained under the rigid inspection and maintenance requirements of the ABS and the U. S. Coast Guard. The vessels are equipped with reliable and advanced communication and navigation equipment.

On this next slide, we are indicating some of the typical design and operating data. The sea speed of all these vessels is about the same and varies between 16 and 17 knots.

One of the items in this slide shows the quantity of segregated and dirty ballast capacity. Under normal weather conditions, northbound vessels carry about 30 to 35 percent of the ship's deadweight tonnage in ballast, while in heavy weather this may amount to 40 to 50 percent. As you know, segregated ballast is carried in tanks which are dedicated to clean seawater ballast and are not connected to the cargo tanks. Accordingly, this ballast water is not in contact with oil and can be discharged to the sea. The dirty

ballast is carried in tanks previously containing crude and is contaminated with oil. Therefore, this ballast will be transferred to a shore receiving facility where oil and water will be separated. How this is done will be briefly covered later in this presentation in the environmental impact statement.

On this next slide we show some of the special design and equipment features. Most of these items relate to safety, communication and pollution prevention and are designed to prevent accidents.

In this respect, you may be aware that a traffic separation system is presently under development by the U. S. Coast Guard for all ships traveling between Valdez and the West Coast. This new system will establish separate routes for north and southbound vessels and is designed to minimize crossing situations, thus reducing the chances of collision. It is likely that vessels scheduled to load at a Gulf of Alaska terminal will be required to use these same routes for part of the voyage. In addition, a vessel traffic system similar to Prince William Sound will probably be developed for the approaches to the terminal.

You may also be aware that the Coast Guard is installing a Loran "C" system which will cover the area from Southern California to Alaska. This navigation system, which, according to the U. S. Coast Guard, is accurate to 1/4th of a mile at the edge of the station's operating envelope and improves to 50 feet accuracy closer to the station, is scheduled to be in service prior to the start-up of the Trans Alaska pipeline and provides accurate vessel position fixing and, combined with the radars and bridge-to-bridge communications, will augment the ship's navigation system to insure the possibility

of collisions and groundings are reduced to as low a level as possible. Vessels to and from the Gulf of Alaska will use this system also.

Turning now to the second subject, a marine terminal or terminals will be necessary to receive crude oil delivered from the wells, store the oil and then load into tankers for delivery to market destinations in the lower 48. These terminals may serve a single company or, in most cases, may be operated as multiple use facilities. A typical terminal installation located ashore is shown in this slide. Terminal storage requirements depend directly upon thruput volumes and tanker sizes and schedules. Storage facilities must be adequate to allow continuous operation of the offshore pipelines, thus minimal storage requirements are usually several times the daily thruput volumes. To place this in better perspective, for a production level of 120,000 barrels per day, a terminal site of about 40 acres with about 1 million barrels of tankage would be required. Because of these large storage requirements, for operational reasons it is generally more advantageous to locate the tanker loading facilities adjacent to or near the shore. However, offshore loading berths cannot be discounted at this time for the Gulf of Alaska until fields are discovered and the feasibility of suitable onshore terminals has been developed.

There are a number of site locations in the Gulf of Alaska, as indicated on this slide, which would be suitable for tanker terminals. In view of the present uncertainty as to where oil will be discovered, no detailed analysis has been prepared for these locations. In the selection of a location, we take into account length of submarine pipelines, water depth, protection from the weather by terrain features, suitable land to build a tank farm, etc. Some of the more favorable sites for terminals near the proposed lease area are:

Yakutat Bay - This location with water depths of 180 feet can accommodate the largest tankers and is currently used for infrequent tanker deliveries and has a dock facility. However, this facility is very limited in size and not suitable for crude tankers anticipated. Several protected waterfront sites exist within the bay which are suitable for a marine terminal. Water depth is adequate near shore to accommodate fixed loading docks while terrain is sufficiently high to protect the shore facilities from high tides and waves.

Icy Bay - The bay with a water depth of up to 60 feet provides shelter from the east and has several potential terminal sites with deep water near the shore. The bar at the entrance to the bay has about 40 feet of water, with the bottom consisting of sand and gravel. Dredging to a depth of about 50 feet suitable for 80,000-ton tankers for a distance of about two miles could be considered. The contiguous land areas are flat with sufficient high ground to accommodate an onshore terminal.

Kayak Island - This area is exposed to the Gulf of Alaska on the east but affords some protection for large vessels on the west side. Deep water areas, 180 to 300 feet 4 miles offshore, have no limitations for large tankers, while the approaches are not restricted by depth or land masses. Due to the exposed location, sea berths would probably be more practical than fixed berths. There is ample relatively flat land for installing tanks and other terminal facilities.

Middleton Island - The west side provides protection from easterly winds and seas, but due to the depth of water, about 80 feet, tankers would have to moor approximately one and one-half miles offshore. Adequate high ground is available on the island for storage tanks and related terminal facilities.

Montague Island - This area has several protected areas with deep water, about 600 feet, to the coast which would be suitable. Onshore land is available for terminal facilities.

The crude oil terminals will be planned and operated in accordance with advanced technology to ensure a safe, pollution free performance with the principal features to be developed to suit the specific sites. Design considerations and operational provisions will be made for rapid response to emergencies such as extreme weather, warning of a tsumani or other contingencies. Of course, the actual location and design of any terminals will require compatible solutions to land use, wildlife habitat and seismic considerations.

Crude oil will be received from the submarine pipelines in all welded steel tankage which will be designed to meet the local conditions, i.e. high snowfall and anticipated seismic forces. Tanks will be provided with automatic gauging equipment with manual back-up, together with high level alarms to guard against overfilling. A containment dike with a capacity of 110% of the total tankage including adequate allowance for surface water impounded within the dike area will be installed. A fire detection and extinguishing system will be incorporated in the design.

Turning now to the dock facilities, a sufficient number of docks will be provided to accommodate the required number and size of tankers. These docks will be equipped with a fendering system and designed to withstand seismic and wave forces as well as docking impact forces. The dock

structure to be used will vary with the prevailing slope and soil conditions of the seabed. For flat or gently sloping seabed conditions, the dock will be constructed from steel jacket or reinforced concrete structures which will be anchored to the sea bottom.

In the case of a steeply sloping sea bottom, a floating dock might be constructed which will have the ability to move in a vertical direction to accommodate tidal movement or wave action. Lateral or longitudinal movement will be restrained by means of rigid struts hinged at the dock and anchor points ashore.

Mooring dolphins for each type of berth will be constructed of steel jacket structures anchored to bedrock or firm soil. Each mooring dolphin will be equipped with quick release mooring hooks for securing the mooring lines from the tankers.

Qualified pilots will be used for all tankers entering or leaving the terminal while tugs and mooring launches will be available to assist in mooring the vessels. In addition to berthing and unberthing tankers, these tugs will be fitted with fire fighting systems capable of delivering foam or water onto the deck of the largest tankers when in light condition.

Loading of the tankers will be by gravity flow if tanks are installed at a sufficient elevation, which is dependent on the topography of the onshore site. In the event elevation is insufficient, loading pumps will be used.

Steel loading arms will be provided on each dock to connect to the ship's piping. These will be operated from a control center on the dock. Shut-off valves will be provided on the docks and onshore in each loading line

to permit either local or remote operation from the control center. This valve arrangement will allow emergency shutdown to be initiated at various points. To prevent excessive surge pressures in emergency conditions, relief valves will be included in the design. These emergency features will prevent internal pressure buildup by more than 10% at any point in the piping system.

To maintain the high water quality standards and scenic beauty of the area, strict operating procedures to guard against the possibility of accidental oil spills and the adoption of design criteria to minimize the risk of oil spills resulting from equipment failure or due to earthquakes will be developed. In addition, a sewage treatment facility and incineration of combustible waste will be provided.

A ballast treatment plant to handle all oil contaminated ballast water and wash water used to clean cargo tanks will be installed. Although advancing technology may result in further improvements, the type of system will probably consist of a three-step process of gravity separation followed by chemical flocculation and dissolved air flotation. The treated water will conform to the applicable water quality standards. In this system, oil contaminated water is pumped into steel storage tanks where, after settling, floating oil is skimmed off and pumped to the oil treating section. After the gravity separation, chemicals will be added to the ballast which will then enter the chemical flocculation and air flotation chambers. The ballast is retained for a specified time in the flocculation chamber where it is subjected to continuous gentle agitation for floc development. This floc has a strong affinity for oil, and the remaining oil in the ballast is captured by the floc particles.

From the flocculation chamber, the ballast flows to the mixing zone, where air is introduced and air bubbles attach themselves to the floc and the mixture flows to the flotation zone. In the flotation zone, the air suspended material rises to the surface where skimming equipment removes the floating matter. The clarified ballast is tested continually for oil content and leaves the treating facility into an outfall line through a diffuser discharging into the port at a point well below sea level.

Oil skimmed in the gravity separation step and that recovered in the flocculation/air flotation process is pumped to the terminal crude storage tanks for loading aboard tankers.

The foregoing description of dock facilities mainly applies to onshore type installations. However, offshore sea berths cannot be discounted until oil fields are discovered and the feasibility of suitable onshore terminals has been developed. Ballast handling facilities for offshore loading berths will be designed to perform a similar function as for the onshore berth. Either the dirty ballast will be pumped ashore for treatment or retained aboard the vessel for subsequent discharge at a shore treatment plant.

These offshore berths could be of several types, including fixed type docks, island type docks, single point moorings or conventional multipoint moorings. In general, the seabed anchoring characteristics, water depth and sea conditions will dictate the most economical and practical type structure.

Offshore loading facilities are relatively common, but until recently they were all located in protected water. However, with improved technology, offshore loading terminals in exposed locations are relatively common, i.e. Kharg Island in the Persian Gulf, Dubai Terminal 60 miles offshore in the Arabian Gulf, Mobil's Nigerian Terminal, Phillips' Ekofisk Terminal in the North Sea, etc. In addition, single point mooring installations are in the advanced engineering stage for offshore locations in the Gulf of Mexico off Louisiana and Texas.

The Louisiana facility will be located about 18 miles off Bayou Lafourche, while the Texas installation will be 30 miles off Freeport. Both facilities will be in a water depth of about 100 feet. Although the difficulties may be accentuated in the Gulf of Alaska, these installations which include tanker safety zones and traffic regulations demonstrate the feasibility of constructing and operating offshore terminals in exposed locations safely and with minimum hazard to the environment.

ADM:mjb

8-5-75

(20)

STATEMENT OF

KENNETH A. BLENKARN, Ph.D.
AMOCO PRODUCTION COMPANY

before the

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HEARING

on

PROPOSED OIL AND GAS LEASING

on the

OUTER CONTINENTAL SHELF

NORTHERN GULF OF ALASKA

ANCHORAGE, ALASKA
AUGUST 12-13, 1975

OFFSHORE DEVELOPMENT AND PRODCTION

Statement of Kenneth A. Blenkarn, Ph.D., Amoco Production Company

OFFSHORE SALE ENVIRONMENTAL HEARING

Anchorage, Alaska

Good morning, ladies and gentlemen. My name is Kenneth Blenkarn. I am a Special Research Group Supervisor for Amoco Production Company, and I direct the development and application of offshore and arctic technology for Amoco and its corporate affiliates. My engineering Ph.D. degree emphasizes training and research in theoretical and applied mechanics. For more than 20 years I have been developing basic technology related to petroleum production, particularly environmental force criteria for
lide 1 offshore structures. I have been responsible for the design of many offshore platforms, including many of the early permanent structures installed in Cook Inlet.

My first purpose is to describe for you the equipment and methods employed in the production of offshore petroleum resources. I then wish to address the special aspects of engineering for applications in the Gulf of Alaska.

Only after exploratory drilling has discovered petroleum deposits, and various testing and confirmation has established adequate reserves, does

actual development of production begin. The key feature of most offshore production is the construction of fixed platforms or towers. These platforms, founded on the sea bottom, support working decks clear of wave action and from which well drilling and production activities are conducted. Most offshore platforms are comprised of three basic elements: jacket, piling, and deck.

lide 2 The trussed or braced jacket is fabricated at a shore location. It is
lide 3 then barged or floated to the offshore site where it is tipped or other-
lide 4 wise maneuvered into position resting on the ocean floor.

Piling are then guided and driven through members of the jacket to fix the structure firmly into the foundation soils. This work is generally
lide 5 performed by special offshore construction derrick barges.

lide 6 Once piling installation is complete, deck sections, together with operating equipment, are hoisted up and placed atop the structure by the derrick barge.

Effective design of offshore platforms requires careful evaluation of the environmental forces to be anticipated during the structure lifetime. This is especially true of forces caused by storm waves. Over the years, the offshore industry has devoted significant effort to the scientific investigation of ocean waves, their occurrence probabilities,

and the forces resulting from waves. Such efforts have contributed to the success of the industry in building reliable offshore platforms.

After construction of a platform is completed, well drilling is initiated generally through specially driven structural well conductor
ide 7 pipes. Several wells are directionally drilled from a single platform to reach an array of locations at the productive horizons. Production from the completed wells is directed into separation and other treating equipment to prepare it for entry into the transportation system.

All of the equipment and tanks on a platform are fitted with automatic safety devices which shut in the producing wells and stop flow through the system in the event of any equipment malfunction. Shut-off valves on the platform deck are supplemented by safety shut-in devices down inside well casings, below the ocean bottom. These are controlled to be activated by abnormalities in the production equipment or in the platform structure itself. The likelihood of oil discharge, even in the improbable event of platform structural failure, is significantly re-
lide 8 duced by use of downhole safety valves. These valves have undergone rapid improvement in recent years and will be able to provide a high degree of reliability.

Generally, the preferred and safest way to transport offshore production away from a platform is to pump it through a subsea pipeline to shore

facilities. The construction of subsea pipelines employs special pipe-lay barges. As successive lengths of pipe are joined on the barge, additional lengths of pipeline are lowered onto the ocean bottom.
.ide 9 Depending upon the water depth, the pipeline is either guided to the ocean bottom by a structural stinger or suspended under controlled tension to preclude bending damage to the pipe. Subsea pipelines are weighted to rest on bottom without movement under changing current or wave conditions. In areas where the pipe is likely to be subject to excessive environmental forces, or to mechanical damage by anchors and fishing gear, the pipe is buried beneath the sea floor. The pipe bury operation is accomplished with unique dredging equipment which cuts a trench into which the pipe is deposited and subsequently to be covered.

Pipelines are coated to protect against corrosion, and construction joints are carefully inspected to avoid mechanical or metallurgical defects. Nevertheless, like platform production equipment, subsea pipelines can be equipped with automatic sensing devices which shut down the throughput stream. These devices serve to minimize the discharge of oil in the case of any leak which might occur in spite of quality control measures in construction.

While pipelining to shore has long been the predominant disposition of offshore production, alternates are being developed. Offshore storage
1 10 and offshore tanker loading have become increasingly common. The latest

developments are engineered to permit continuation of operations even under stormy sea conditions.

Additional detail regarding various potential development systems for the Gulf of Alaska is to be found in a supplemental document which I submit for the record.

The basic methods for production from offshore locations are well established and proven. The question at issue in these hearings is whether such technology is suitable for application in the Gulf of Alaska. More specifically, the concern is with our ability to adapt this proven technology adequately to account for the particular physical environment of the area. I intend to show that such an adaptation can be made. I will discuss the two important implications of the environment of the Gulf of Alaska. The physical oceanographic conditions and earthquakes.

The Gulf of Alaska is recognized as a stormy region, and one must address the influence of weather and waves upon the safety of offshore facilities. At the heart of the matter is the effect of storm waves on the structural integrity of offshore platforms or other structures.

Testimony by Mr. Horrer describes studies of the physical oceanography of the Gulf of Alaska and our knowledge of expected conditions in this

region. For the present concern, the main result is a comparison of
ide 11 extreme Gulf of Alaska wave conditions with those determined for the North Sea. This comparison is shown on slide 11. There is no real definable difference in the severity of extremes in the two areas. This is important because a number of offshore platforms have been designed to withstand North Sea extremes. Several of these have already been installed. There is no question of our ability to design platforms to resist Gulf of Alaska extreme waves.

ide 12 Some of the recently designed North Sea platforms represent a marked departure from traditional modes of offshore platform construction. Specific attention is drawn to the concrete, gravity-foundation platforms. It is, however, to be recognized that this particular development is a reflection of (a) construction schedules and economics, (b) foundation soil conditions, and (c) premium placed on storage capacity. The choice of a concrete gravity platform as opposed to a more conventional steel structure is not a consequence of the particular design wave requirements. There may emerge special platform designs for Gulf of Alaska operations, but such designs will not be dictated because wave conditions are more severe than encountered elsewhere.

The generally stormy weather of the North Sea has led to the construc-
ide 13 tion of larger, more seaworthy construction ships and barges, for example, very large derrick ships and semi-submersible pipelay vessels. These

advances have been motivated by the need to improve the effective working time of construction equipment. It is to be expected that much of this construction experience will carry over directly to application in the Gulf of Alaska.

The Gulf of Alaska region is, of course, recognized as being prone to earthquake activity. Hence, as in the case of design against waves, the industry must build structures to resist anticipated earthquakes with a high degree of reliability. This is required for reasons of both economics and personnel safety. Nevertheless, we must balance risks against the costs to society of reducing such risks. It is not in the best
Slide 14 interests of society to squander capital, material, and human resources in needless overdesign of offshore structures. In seeking the proper balance of design, the industry looks to the professional community, as well as its own scientists and engineers.

The technology of earthquake design has been developing for many years. As Dr. Wiggins explains, it combines inferrences of seismically induced base rock and ground motions together with analyses of resulting structure and foundation behavior. I think that it is important to emphasize that this is not just a matter of interpreting seismic measurements by mathematical manipulations. Methods and practices of earthquake design have been adjusted and calibrated from observations of actual structures

in earthquakes; some fail, while others experience earthquake shaking without damage.

The focus of earthquake design is to provide a structure adequate to withstand statistically projected seismic conditions anticipated at the construction site. Dr. Wiggins testimony outlines the basis for this technology. Of course, there is no such thing as a structure which can be guaranteed against failure, regardless of cataclysmic events which nature might someday bring to pass. This is not to say that such imponderables are to be simply ignored. Serious conjecture about such events can provide useful input to the overall design process. These ideas may, for example, suggest design refinements which give a structure the potential to sustain extensive damage without collapse, but which do not subvert the basic design indicated by established earthquake engineering practice. Once again, it is to be noted that in the unlikely event of structure damage or even collapse, the likelihood of pollution by uncontrolled well flow will be further reduced by the functioning of downhole safety shut-off valves.

On balance, there is little doubt but that we can design offshore platforms with appropriate levels of earthquake resistance. It is important
lide 15 to observe that offshore structures, unlike most conventional buildings, are predominantly designed against lateral loads. And there is an extensive experience in such designs. The wave loading on a platform may well be of the same magnitude as design earthquake forces. Moreover,

in-service experience shows that offshore platforms display a substantial margin between design forces and those actually required to cause collapse.

Ocean bottom soils are particularly important in considering design against possible consequences of earthquakes. Local soil conditions affect the intensity of local seismic loading and the foundation integrity for structures. The soil of the ocean bottom also determines the susceptibility of pipelines to seafloor slides triggered by earthide 16 quakes. The industry has already initiated investigations of the Gulf of Alaska sea bottom through use of soil borings and soil seismic surveys. Testimony by Mr. McKeever describes such activity in some detail, and places it within an overall geologic perspective. Extensive and detailed investigations will take place during exploratory drilling and in preparation for development of permanent facilities. The purpose will be to identify suitable sites for offshore structures and proper routing for pipelines, all to reduce earthquake damage hazards. Surveys with soil sampling and seismic methods also serve to avoid the placing of installations where there is likelihood of disruption by surface faulting or soil movement.

One might perhaps be concerned over direct disruption of oil wells by fault movement during earthquakes. However, there is a body of experience to indicate that this is not a significant problem. Extensive

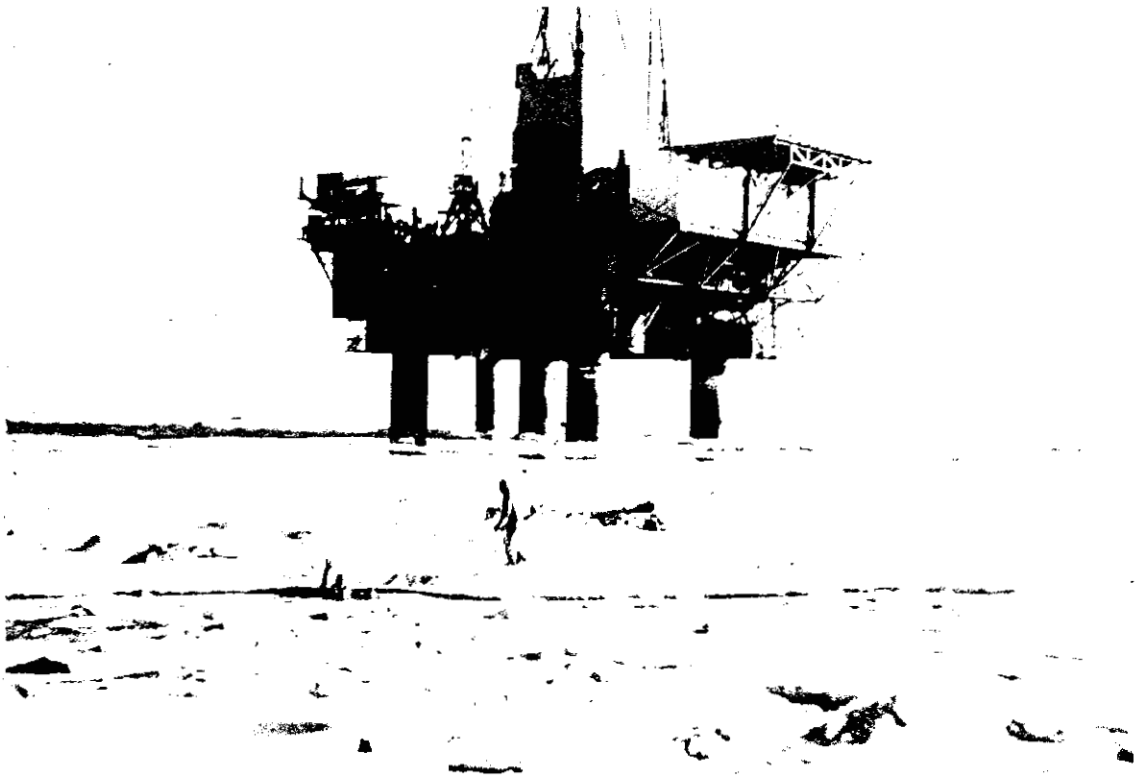
drilling and producing operations have been conducted in the seismically active area of Southern California. While a few wells have suffered casing damaged by fault movement, such damage has not occasioned release of well fluids to pose a pollution threat.

Consideration of the foregoing leads me to the following conclusions regarding technology for offshore production in the Gulf of Alaska:

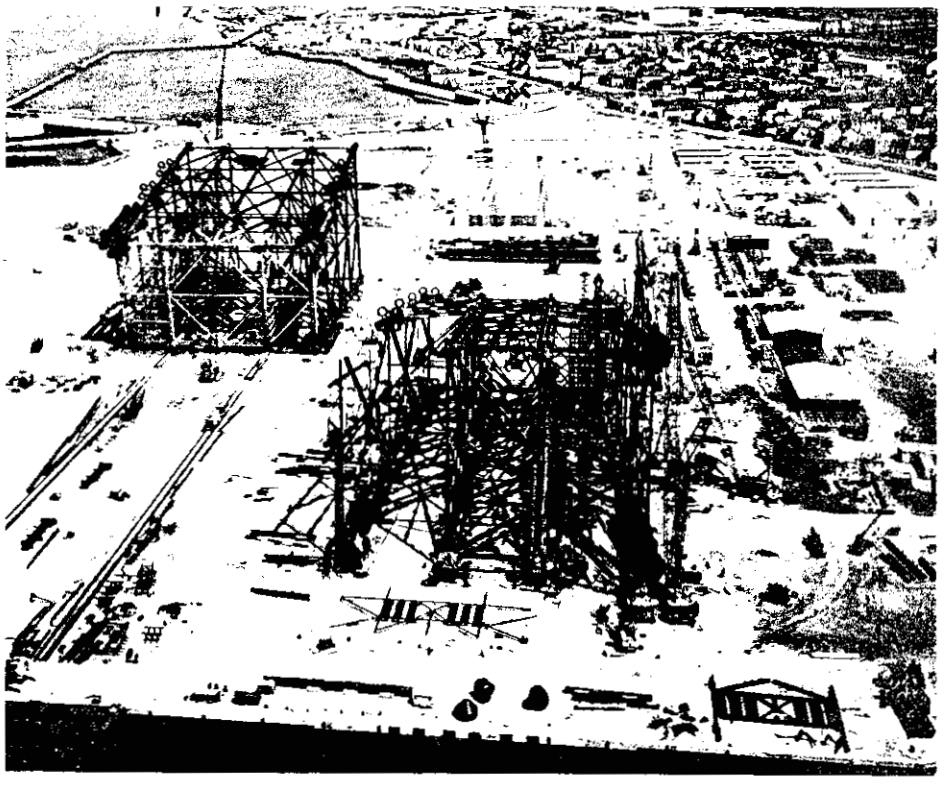
1. Most of the established production technology previously described here is directly applicable to operation in the Gulf of Alaska.

2. Wave conditions in the area against which facilities must be designed are not any more severe than already overcome by the industry.

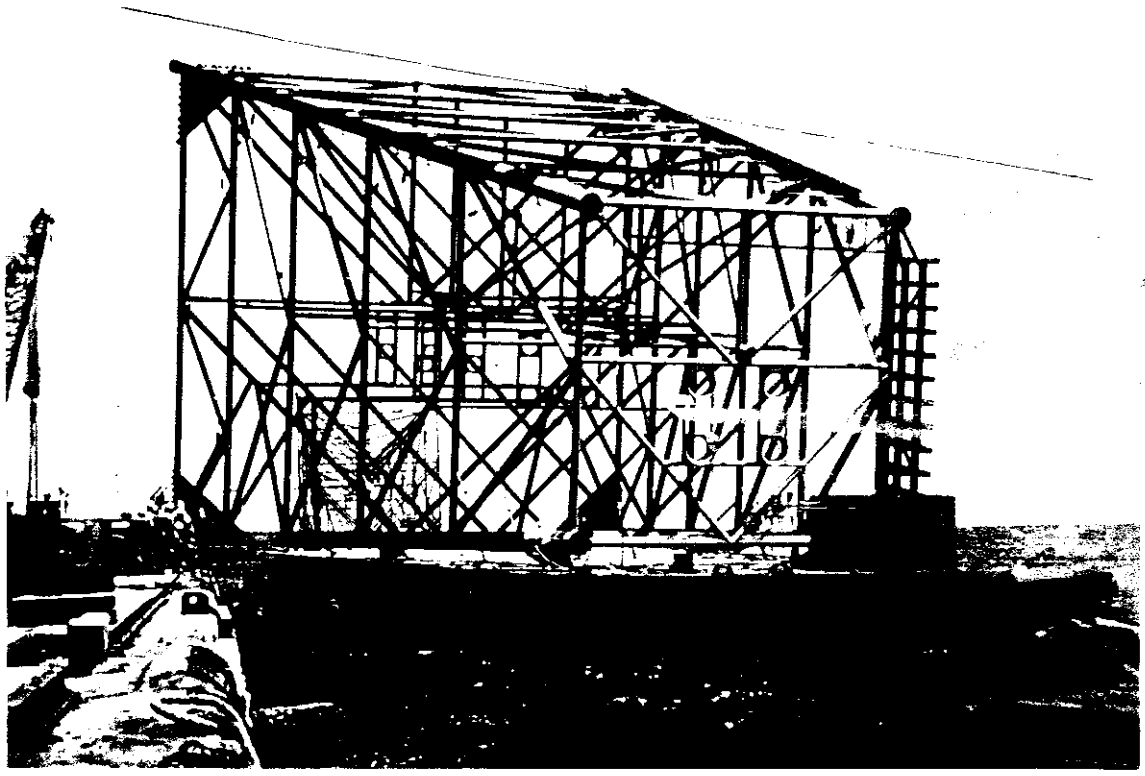
3. Available earthquake technology provides means for construction of platforms and other facilities with adequate structural reliability.



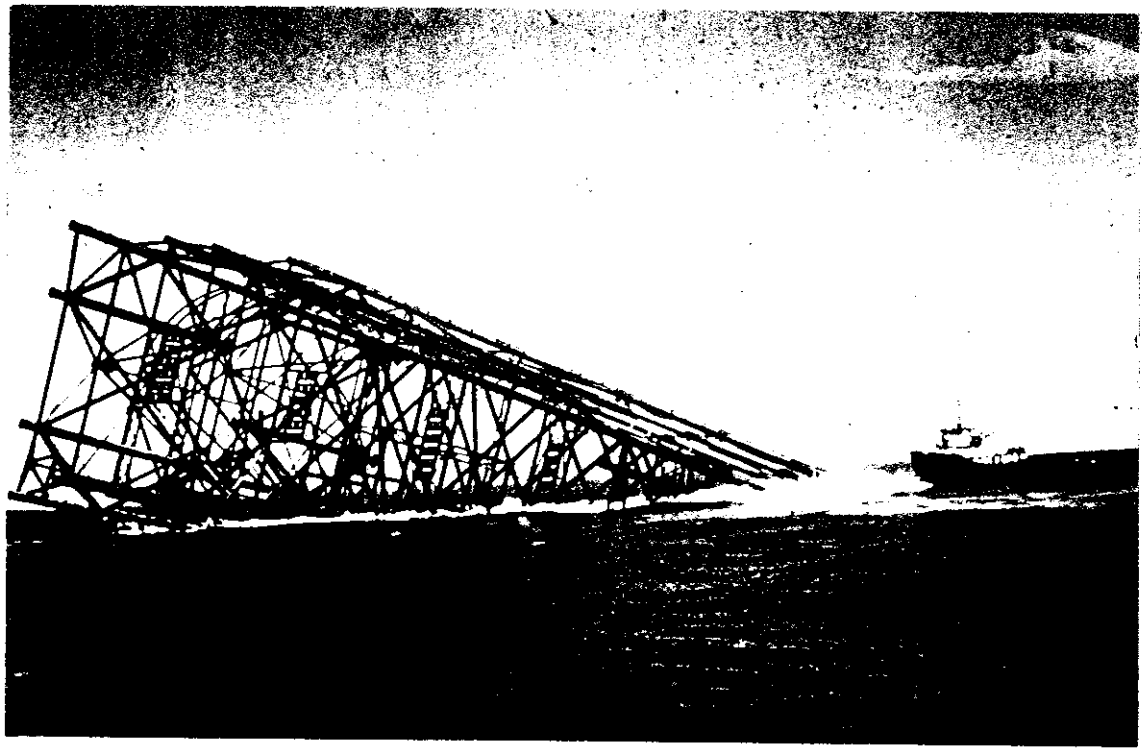
SLIDE 1 COOK INLET PLATFORM



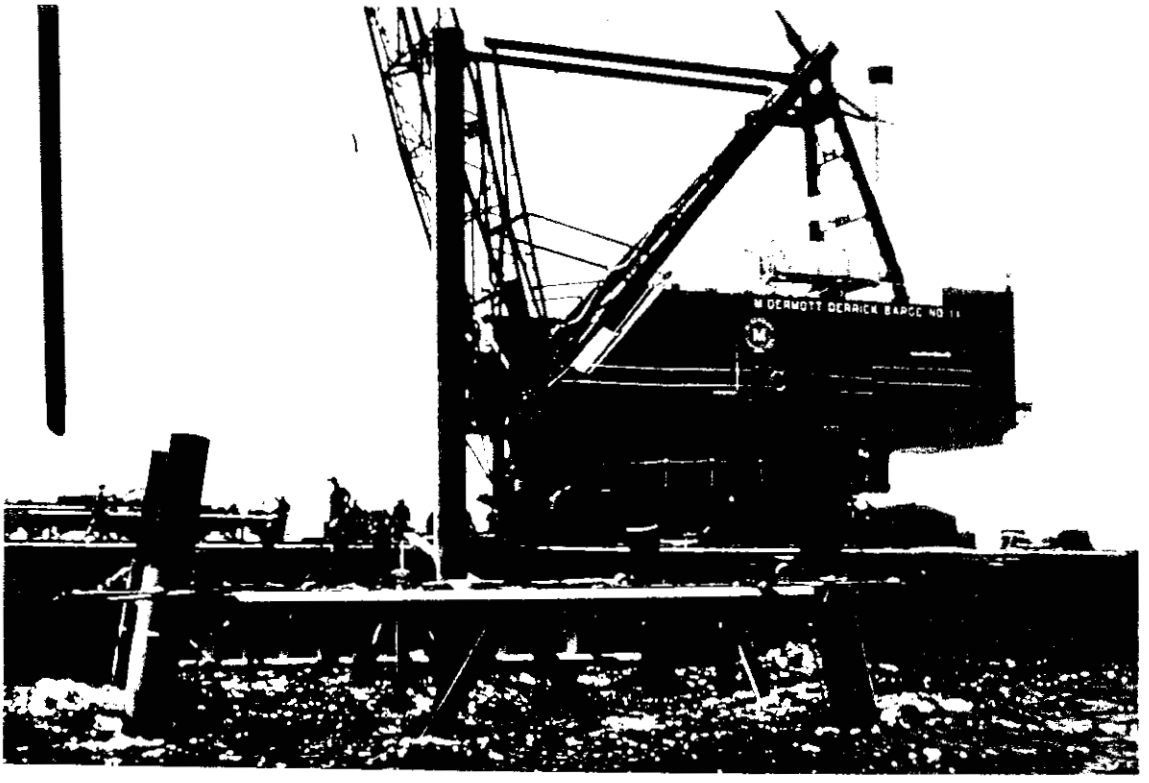
SLIDE 2 PLATFORM JACKET IN FABRICATION



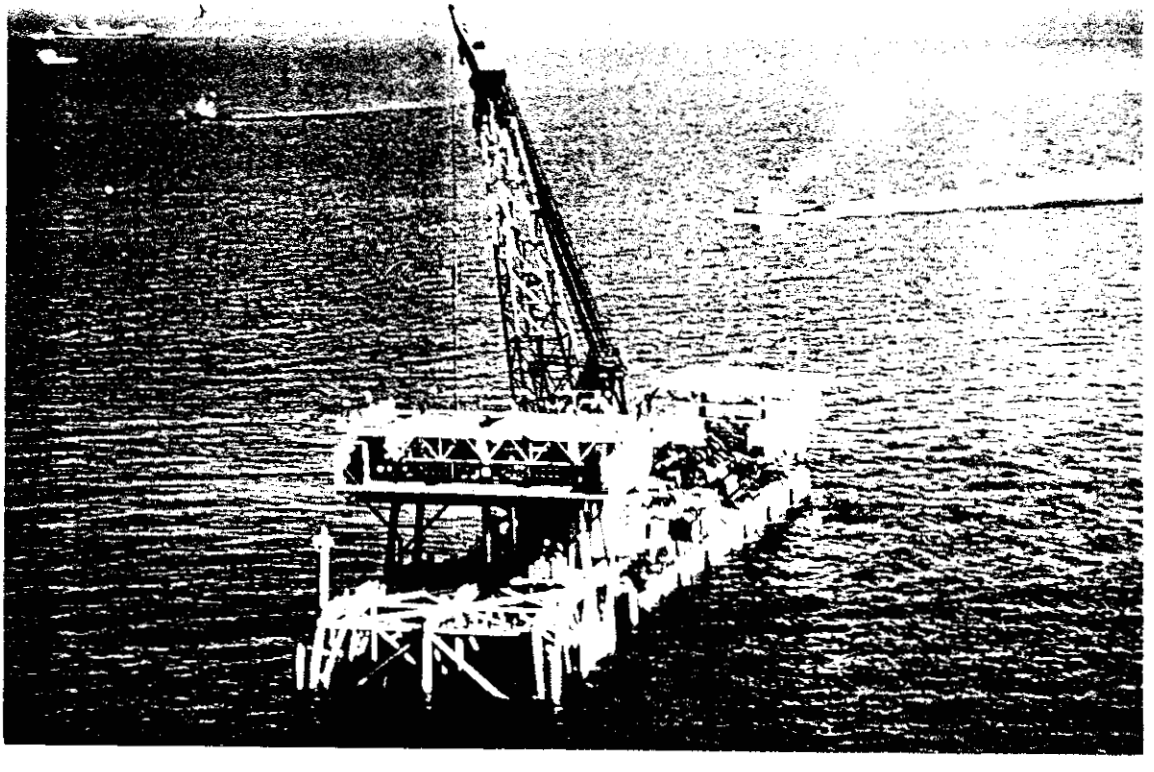
SLIDE 3 JACKET BEING TRANSPORTED



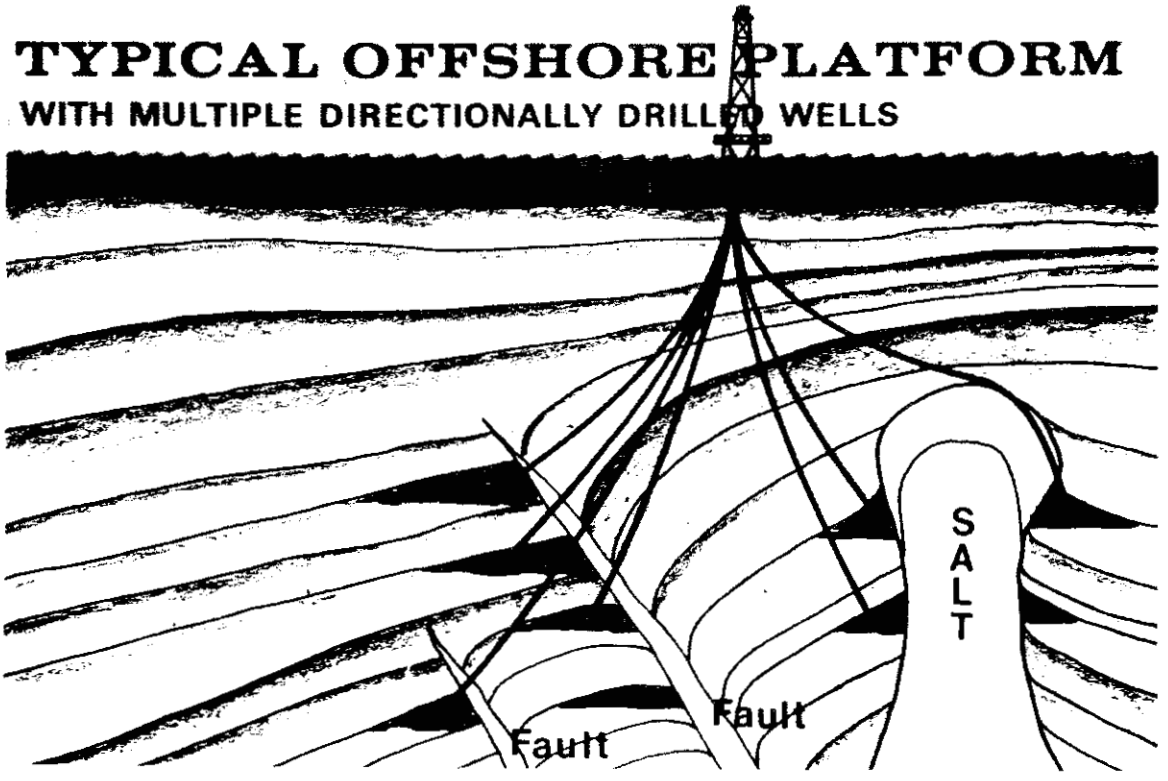
SLIDE 4 JACKET BEING LAUNCHED



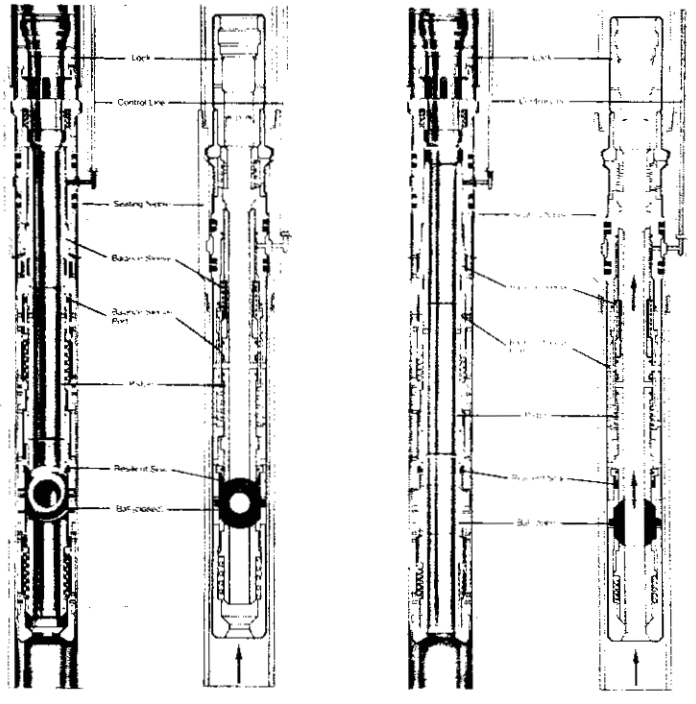
SLIDE 5 PILE DRIVING



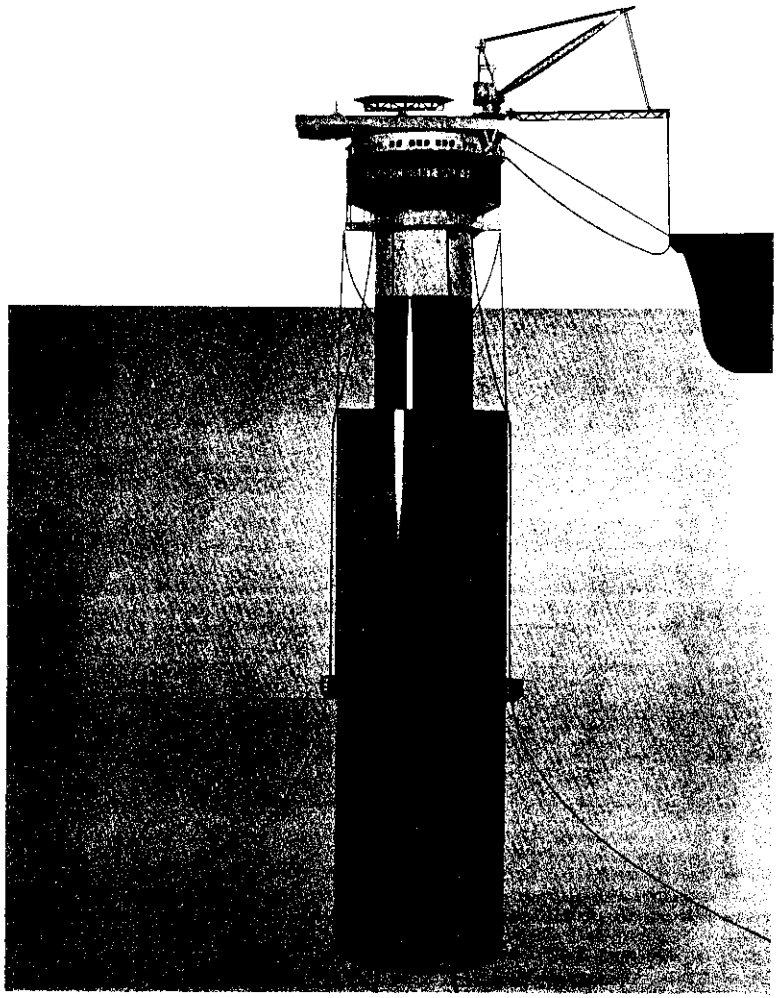
SLIDE 6 DECK LIFT



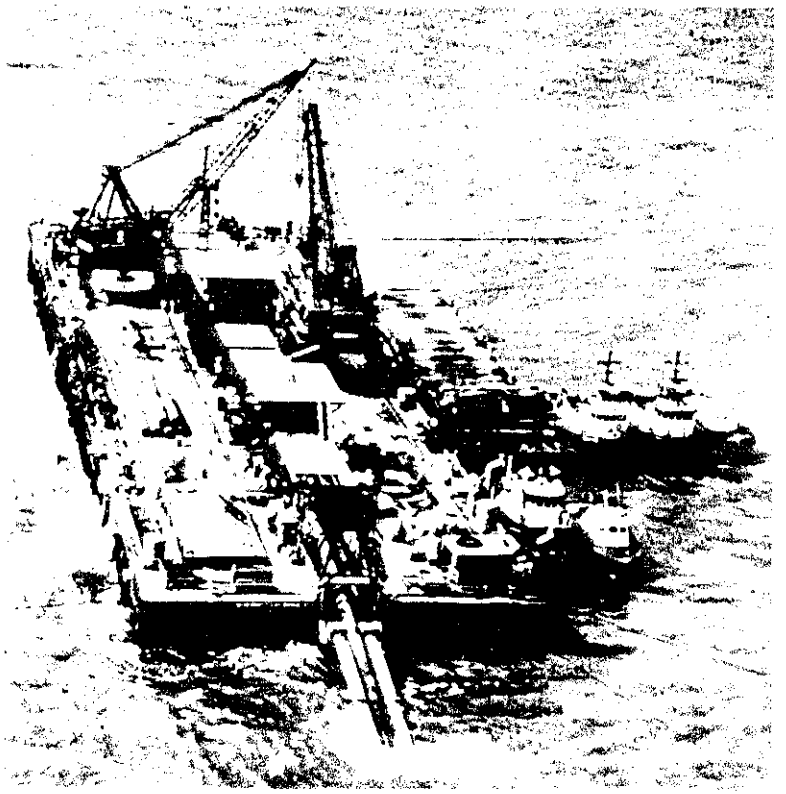
SLIDE 7 SCHEMATIC OF DIRECTIONAL DRILLING



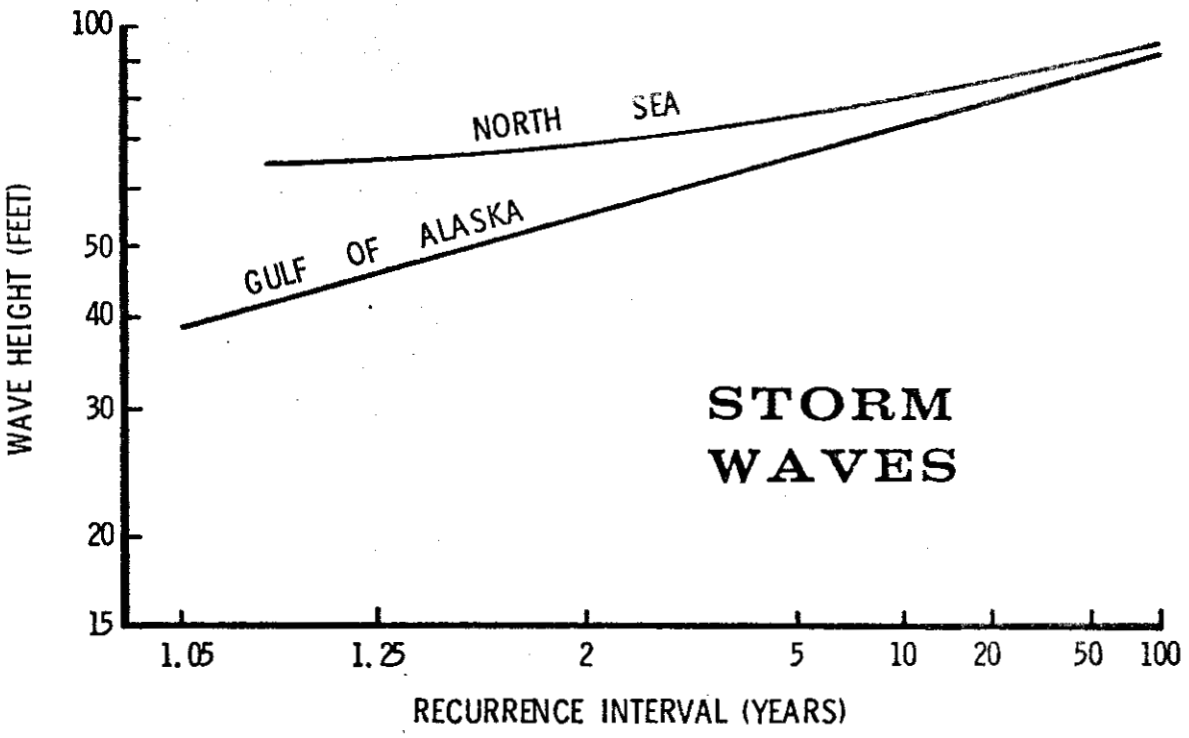
SLIDE 8 DOWN-HOLE SAFETY VALVE



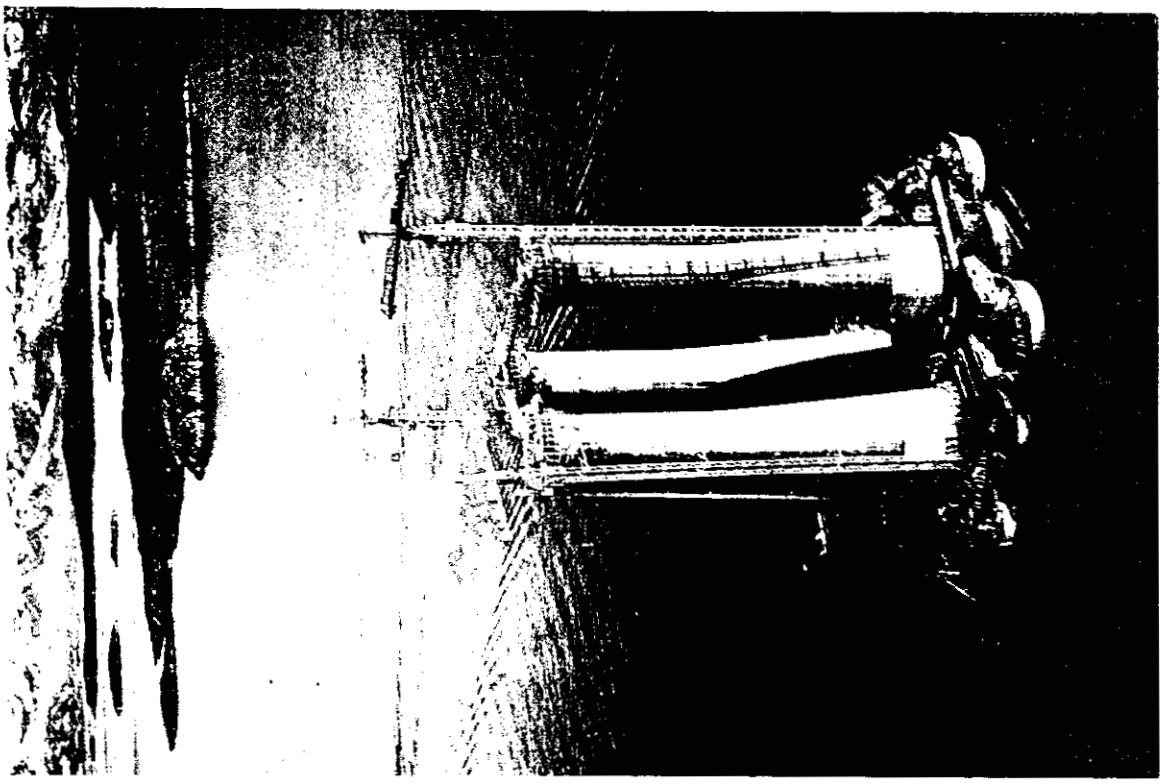
SLIDE 10 OFFSHORE STORAGE AND TANKER LOADING



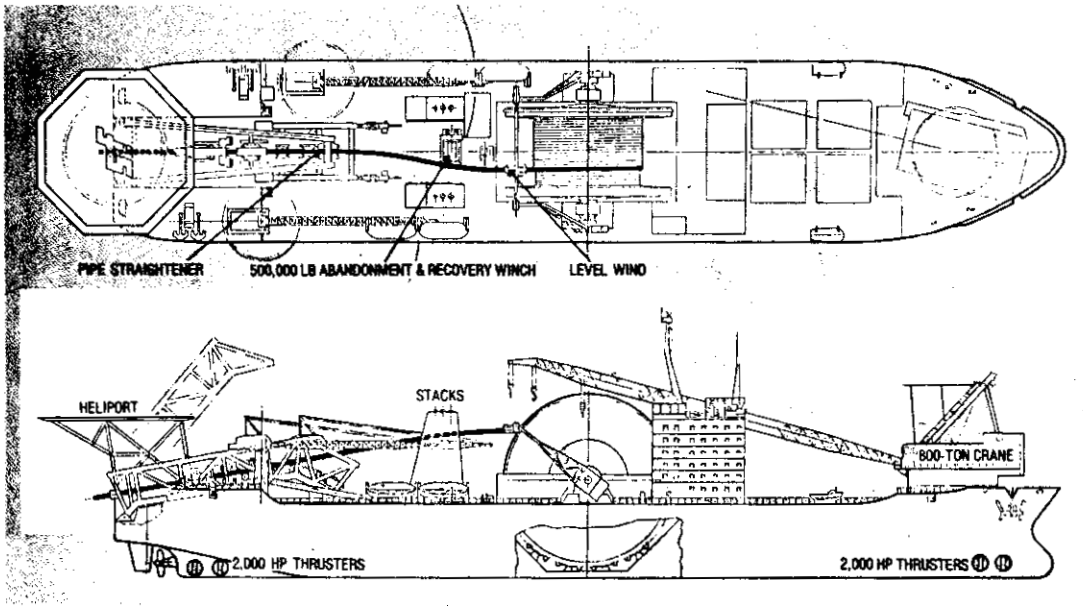
SLIDE 9 PIPELAY BARGE



SLIDE 11 GULF OF ALASKA AND NORTH SEA STORM WAVES

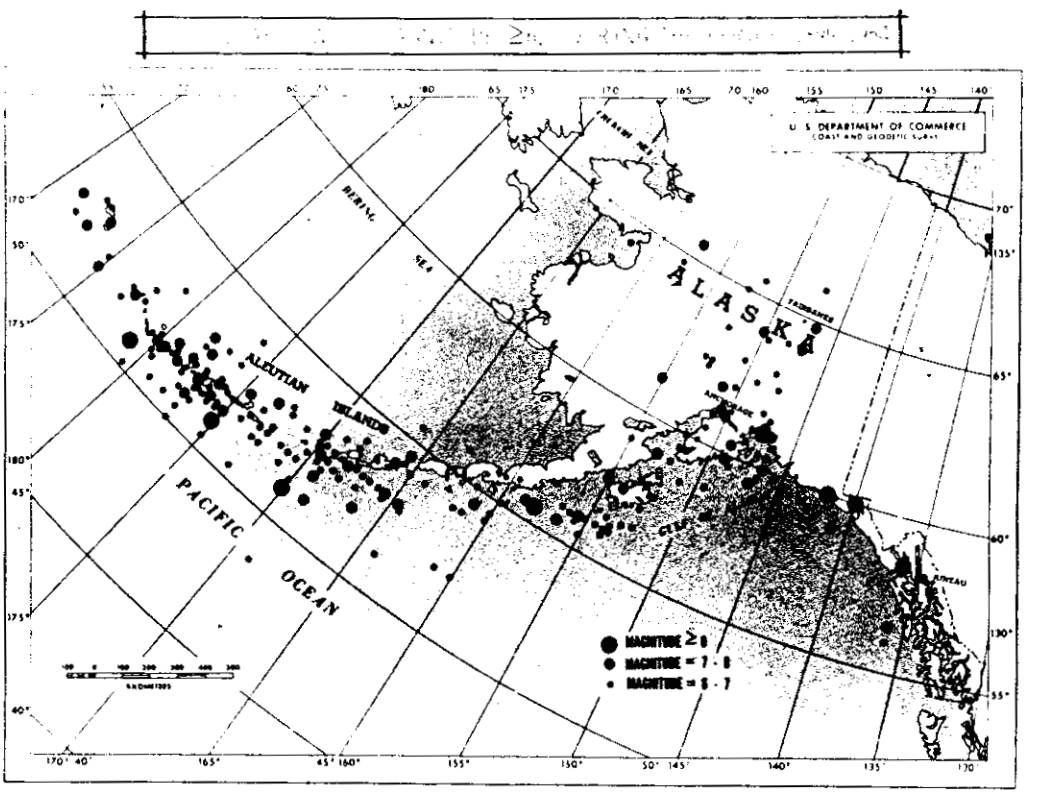


SLIDE 12 CONCRETE, GRAVITY PLATFORM

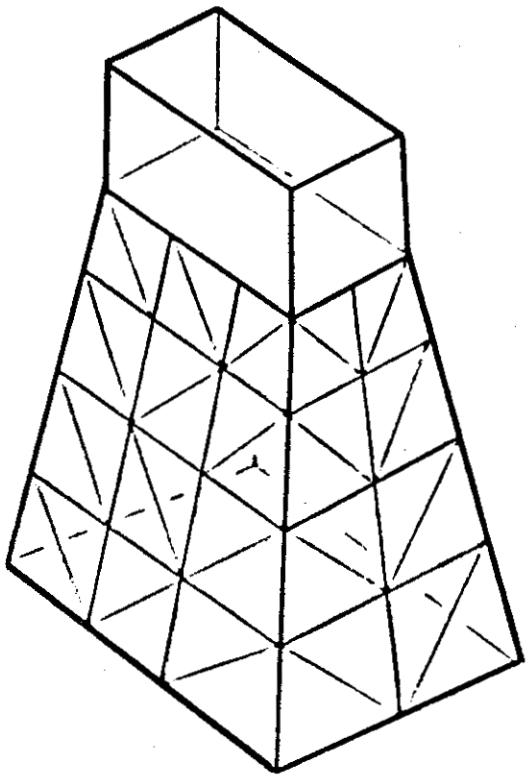


SCHEMATIC OF THE PIPE LAY SHIP A level wind feeds wraps of pipe on and off the reel. As it is wound around the reel, the pipe acquires an ovality of 1.5%, but after it is straightened, an ovality springback reduces this to about 0.1%. Shown here the pipe is entering the water at a shallow angle. The truss can be elevated to increase this angle to 55%.

SLIDE 13 NORTH SEA CONSTRUCTION VESSEL



SLIDE 14 GULF OF ALASKA EARTHQUAKE LOCATIONS



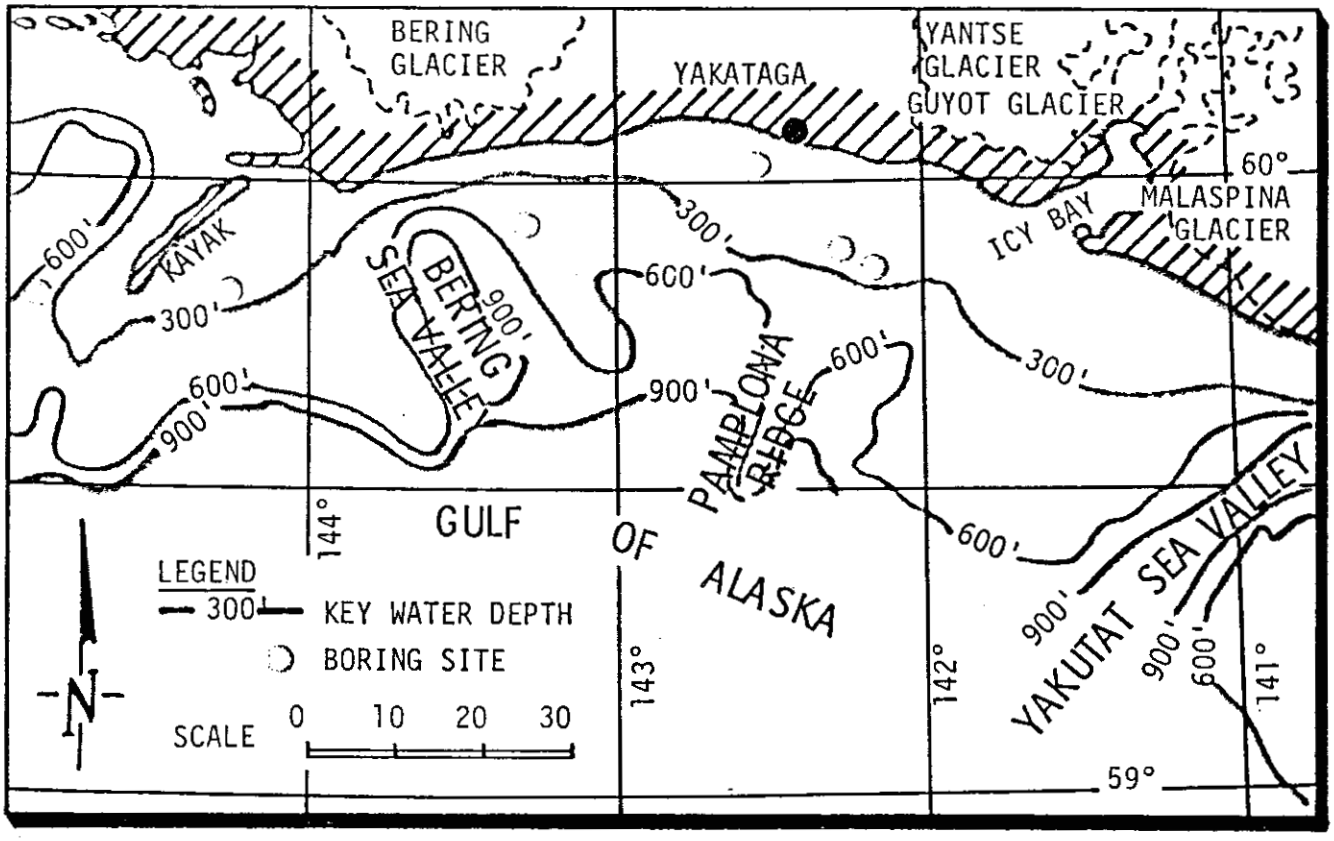
WAVE vs. EARTHQUAKE LOADING

EXAMPLE PLATFORM

IN 300 FOOT WATER DEPTH

FOUNDATION SHEAR	FOUNDATION OVERTURNING
6,000 TONS	1,200,000 TON-FEET
7,300 TONS	1,800,000 TON-FEET

SLIDE 15 COMPARISON OF WAVE AND EARTHQUAKE LOADING



SLIDE 16 SOIL BORING LOCATIONS

SECTION 3 OF 5

DEVELOPMENT AND PRODUCTION

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DATE

DECEMBER 15, 1971
REVISED AUGUST 1973

SECTION III OF V

DEVELOPMENT and PRODUCTION

for the

GULF OF ALASKA OPERATORS COMMITTEE

by the

GULF OF ALASKA GROUP OCEANOGRAPHIC SURVEY

TECHNICAL COMMITTEE

DEVELOPMENT AND PRODUCTION

GULF OF ALASKA

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DEVELOPMENT AND PRODUCTION

GULF OF ALASKA

Introduction

Much of the oil and gas produced from offshore U.S. is obtained from what are called self-contained drilling and production platforms. These platforms are built onshore, then towed and set into place at offshore sites determined by prior exploratory drilling. The platforms are pinned to the ocean floor by means of long steel piles placed through the legs. These platforms are truly self-contained with all necessary supplies, equipment, quartering facilities and personnel to operate independently for extended periods.

After the platforms are in place, drilling equipment is set and drilling operations then begin. Wells are drilled directionally from the platforms and the bottom of a well may be over two miles horizontally and as much as four miles vertically from its surface location on the platform. As many as 60 wells have been drilled from one platform but usually there are no more than 24 wells, primarily because of the size limitation of the oil and gas bearing reservoirs.

Gas is transported to onshore distribution facilities by pipelines which are laid on the ocean bottom. These pipelines are buried in surf zones and unusual problem areas. Most oil is pumped to shore through pipelines, though it is also shipped via pipelines to offshore loading facilities (terminals).

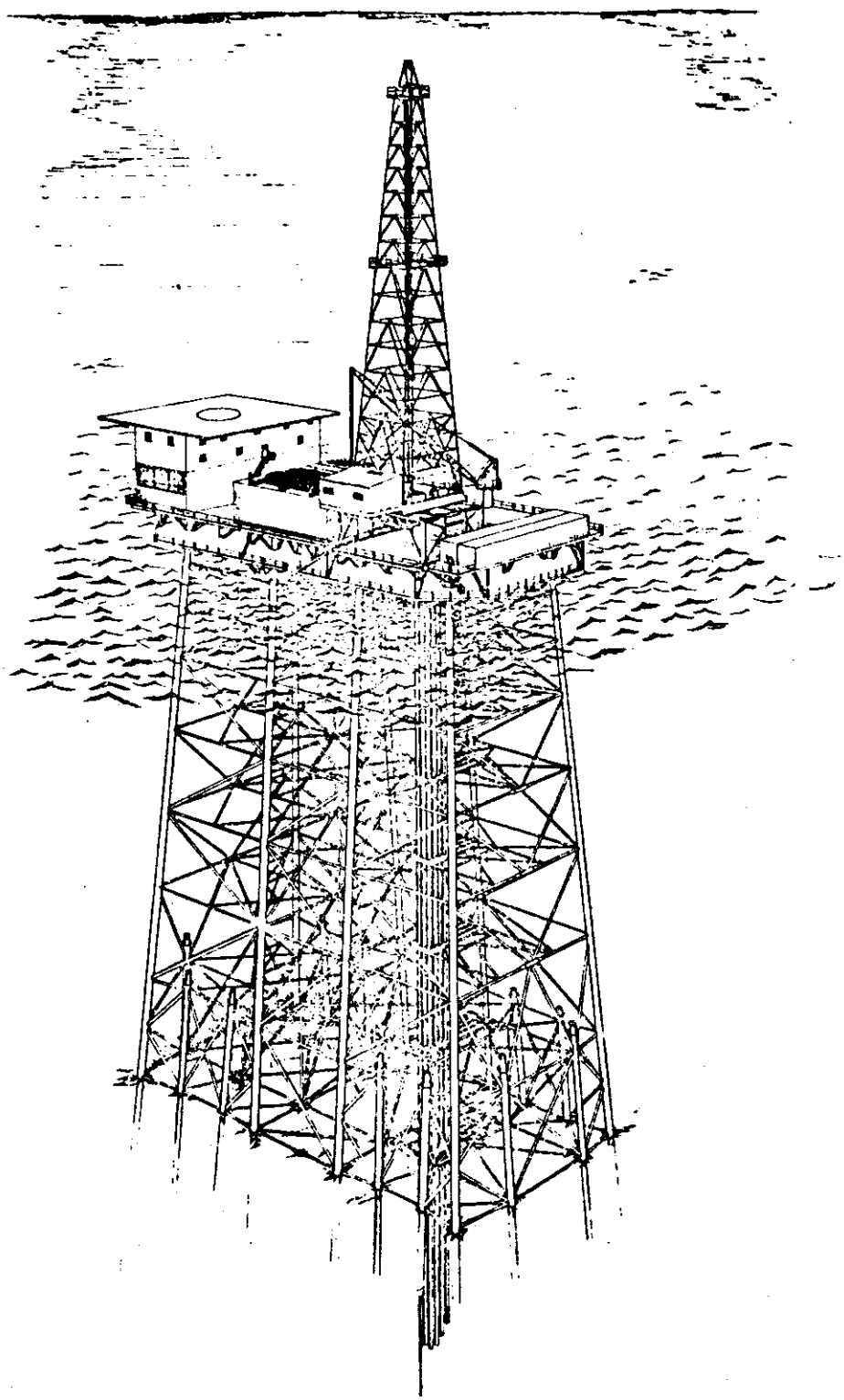
After oil is produced from offshore wells and processed on platforms it is piped to a 500,000-barrel or larger storage tank which is located in over 100 feet of water. The oil is then pumped from the tank through floating hoses to tankers moored nearby. In some fields the tankers are tied to large (≈35 feet diameter) floating buoys and the oil is piped from the storage facilities to the anchored buoys via underwater pipelines to the floating hoses.

The type of development method that would be the safest and most economical for the Gulf of Alaska will depend on water depth, location, and other physical features. Neither the specific ocean environment (waves, wind, etc.) nor the water depths impose insurmountable technological barriers. Platforms and facilities have been designed for environments nearly as severe. Those for the North Sea, for example, are being designed to withstand 90- to 100-foot waves. Platforms have also been designed for deeper waters; one has been designed for over 800 feet of water off the West Coast and one has already been installed in 375 feet of water in the Gulf of Mexico. Five platforms are now being constructed for the North Sea to be installed in approximately 460 feet of water. Analytical methods to design offshore platforms and facilities to withstand earthquakes have been developed and are being improved. Capability now exists for the construction of earthquake resistant platforms but just as in the case of commercial building, construction, design, and analysis work, we are continuing to improve our knowledge and efficiency. Pipelines are being laid in the North Sea in over 400 feet of water so oil and

Platforms

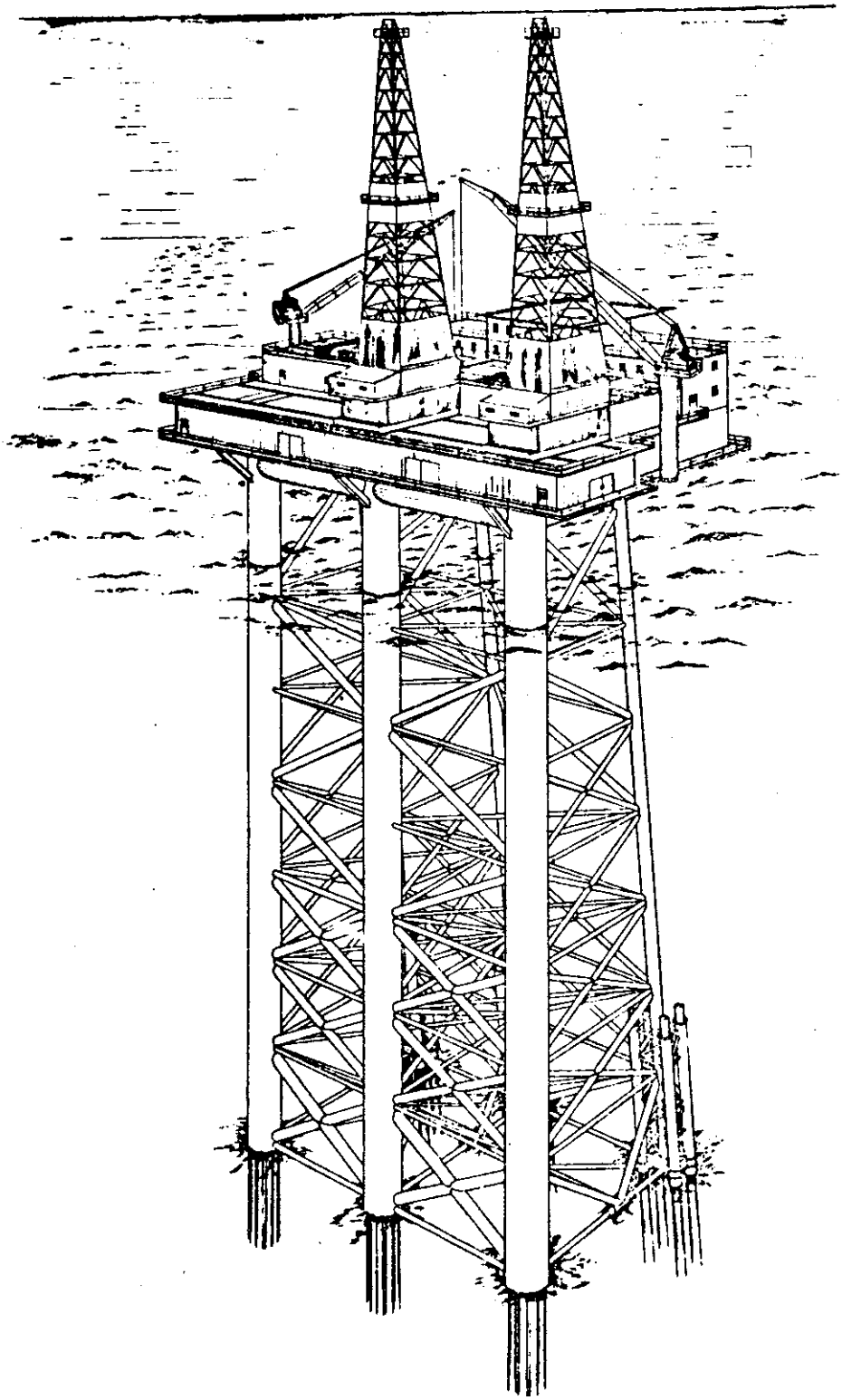
A considerable backlog of experience has been built up over the past 20 years by the oil industry in the design of platforms, especially in the Gulf of Mexico and off the California coast. Though design procedures vary somewhat, the following items are being considered in order to complete the design of a platform:

1. Platform design criteria are being established. Design wave height, wave period, wind and current are being decided upon, using the best available data and analytical techniques. Earthquake criteria are being determined for those platforms that have to be located in a seismically active area. Structural icing criteria are being established if the platform is to be so exposed.
2. Soils information will be obtained from the specific platform site and analyzed to determine the type of foundation which will be required. Sea bottom surveys will be performed to determine water depth, bottom slope, presence of boulders, mud slide potential, etc., for each platform location.
3. The number and location of wells and the type and size of equipment on the platform at various times during its life will be determined. This will establish the platform dimensions.
4. Availability of platform fabrication and installation equipment will be checked. Platform configuration will certainly be influenced by those considerations.



DEEP WATER 350'-450'
TEMPLATE PLATFORM

FIGURE 1



DEEP WATER TOWER/TEMPLATE

FIGURE 3

dual fuel units (natural gas/diesel) which automatically switch from one fuel to the other. This would allow using natural gas fuel and/or diesel fuel during development drilling. The water injection turbines could be fueled by natural gas only. The maximum use of natural gas for power would minimize air pollution potential.

Primary power would probably be high voltage alternating current with the drilling rigs using rectified DC power. Reciprocating gas lift compressors could then use the primary voltage. Shipping pumps, waterflood supply pumps and utility service would probably use transformed AC electric power.

Pressured fuel gas could be supplied by gas turbine powered centrifugal compressors consisting of at least two identical units.

Excess gas can be shipped elsewhere for disposition or can be reinjected. Depending on the quantity available, dehydrated and scrubbed gas can be pressurized for fuel and transmission by the same compressors. A venting system will be required for safety and pressure relief.

Cranes would probably be independently powered by reciprocating diesel engines.

Gas in excess to that required for fuel can be shipped elsewhere for disposition or injected into an appropriate portion of the reservoir. A venting system along with a safety flare will be required for safety and pressure relief.

All facilities will be constructed, equipped, maintained and operated in accordance with OCS Orders and other regulatory agencies as a minimum requirement. The latest oil spill prevention equipment, such as drip pans, segregated drains so that all potentially oily water

Emulsified crude oil may be measured and shipped from the platform via submarine pipelines. Crude oil would be processed onshore or offshore before being shipped to the terminal. The associated or solution gas is expected to be transported ashore for sale to liquified natural gas plants. If economics do not justify such plants, the gas will probably be injected into an appropriate place in the reservoir.

Development Drilling from Fixed Platforms

Development drilling in the Gulf of Alaska from a fixed platform will most likely be from two rigs on each platform. The rigs would be winterized and capable of drilling year-round.

All wells will be drilled in accordance with the Gulf of Alaska OCS Orders as a minimum requirement. Operations would be carried out under accepted good practices, similar to those established in the Cook Inlet.

Development drilling itself has very little impact on the environment except for the increase in activity. Drill cuttings will be disposed of in accordance with OCS Regulations and with whatever other governmental regulations that apply.

As soon as the exploratory program indicates a field large enough for development, construction of platforms for development drilling and future production facilities can begin. This period of time, including moving and installation, is estimated to require two and a half years (Item 4). This phase would be completed approximately seven years from the date of a lease sale. Development drilling (Item 6) will require approximately three years, depending on the number of wells required. It is thus predicted that substantial oil production would not occur for approximately eight years from the lease sale date.

Design construction and installation of producing facilities, pipelines, tanker terminals, etc., (Item 5) will require about three years beginning near the end of the exploration phase.

Maximum rate of production of oil will probably not be realized until an additional two years have elapsed or ten years from the date of the lease sale.

SUBSEA COMPLETIONS

Subsea completions are a relatively recent development in the oil industry's continuing effort to produce hydrocarbon energy to supply today's energy-starved world. In past years sufficient reserves were discovered either onshore or in the relatively shallow offshore areas of California, Louisiana and Texas (less than 300-foot water depths. That picture has changed in recent years and the growing demand for energy has pushed the oil industry into deeper and deeper waters and into the more hostile environmental areas of the world. Since the first commercial subsea completion by Shell Oil Company in 1962 in the Santa Barbara Channel, and subsequent completions by Texaco, Standard Oil Company of California, Atlantic Richfield, and others, this phase of the oil industry has experienced a rapid rate of growth in technology and hardware. The first subsea completion depended on divers for much of the wellhead hookup and therefore the working time on bottom was limited by equipment and technology available in 1962. This limitation alone probably delayed the practical use of subsea completions several years as the economic incentive was not there. This also helped to delay the development of the necessary hardware required for such completions. Subsea completions have been made in most of the offshore hydrocarbon producing areas of the world since these initial completions were made.

Industry interest in areas such as the Gulf of Alaska, Santa Barbara Channel, and deep water areas offshore Louisiana and Texas helped revive the interest in subsea completions. There are several

studied as this affects flowline lengths and sizes, underwater obstacles encountered, relationship to other wells and facilities, and many other factors. Consideration must be given to effects upon other activity in the area such as fishing and shipping in order not to interfere with their use of the area. All these data must be studied before the final decision can be made as to the time economics and physical limits of a subsea completion in a particular area.

The previous discussion has been limited to "conventional" subsea completions, completing one well at a location using presently available tools and technology. Advanced methods of subsea completions are underway. None of these systems have to date been used on a live well, but are in the design or test phase of their development. Three systems that are further along in their development are (1) the cluster concept (Figure 5) where several wells are drilled through a circular template with a service capsule housing controls and valving located in the center, (2) the row concept (Figure 6) where several wells are drilled through a rectangular template with a submersible work chamber servicing the wells, and (3) the single well cellar concept (Figure 7) where single wells are drilled and completed within a large cellar, each cellar serviced by a diving bell-type work chamber. Each of these three systems have merit and parts of each system have been used on live wells. Much development needs to be done in this area as these and other systems have their place in the development of hydrocarbon reserves in deep water and remote areas.

Drilling would be accomplished from either a semisubmersible type drill vessel that is anchored over the drill site or a drill ship that would utilize dynamic positioning with or without the use of anchors.

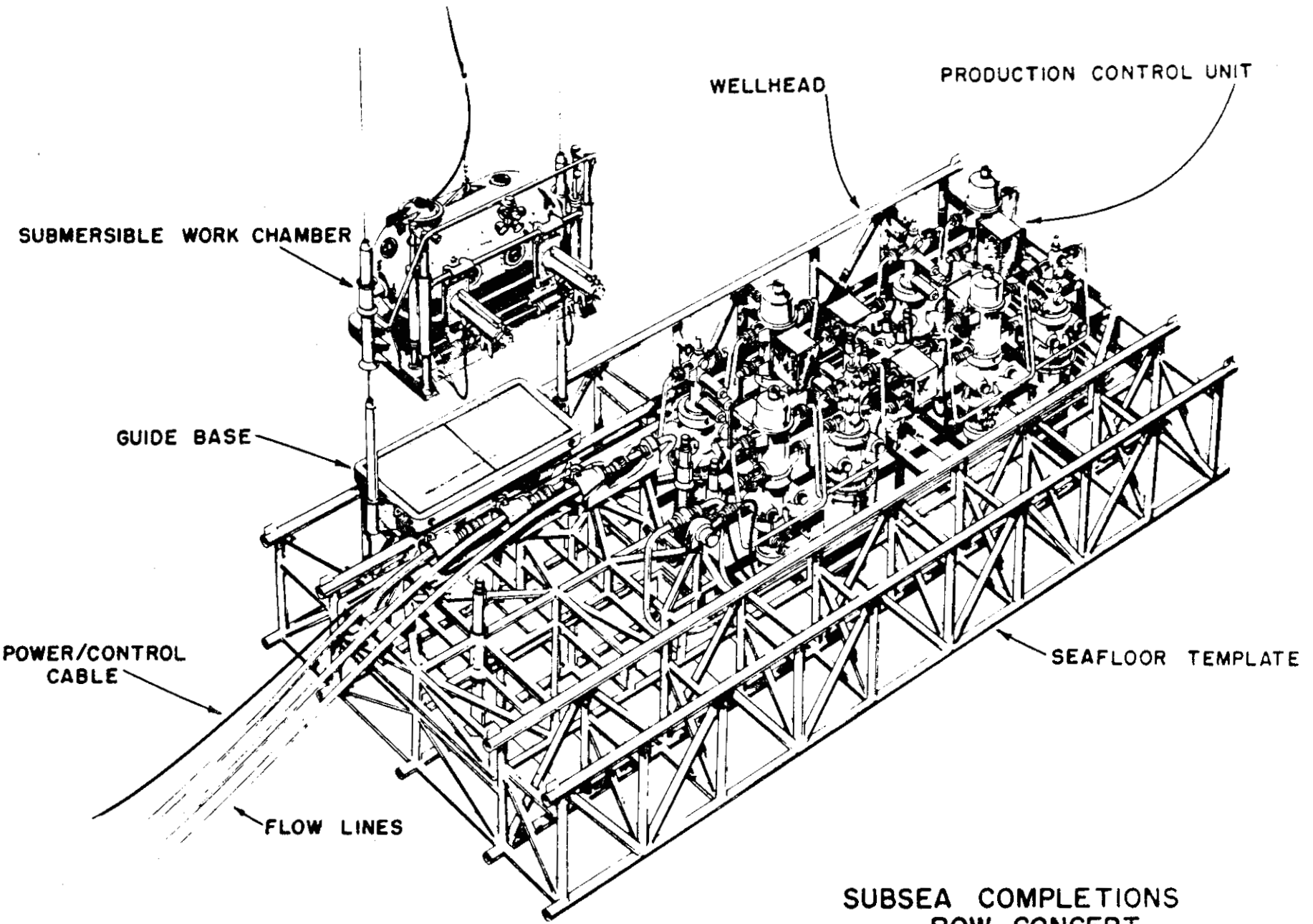


FIGURE 6

SUBSEA COMPLETIONS
ROW CONCEPT

SUBSEA PIPELINES

Pipelines are accepted as the most versatile and consistent means available for moving large volumes of oilfield products. This is especially true in the offshore regime where pipelines have an unparalleled safety and service record. Based on this, it is logical to expect that pipelines will be the primary mode of oil and natural gas transportation in the Gulf of Alaska.

Utilization of pipelines requires a careful and detailed design effort prior to the installation of these lines. This effort includes both on-site field surveys and analytical studies. Current, wave, and tide conditions are evaluated and the forces these environmental actions impose during the installation and the life of the pipeline are quantified. On- and sub-bottom foundation conditions are also investigated and taken into account during route selection for the pipeline. Particular attention is paid to adverse seabottom topography. Areas having unstable or excessive slopes, large boulders and related problems are avoided if possible. Where it is impossible to avoid such occurrences the pipeline and its appurtenances are modified to provide adequate strength and stability characteristics.

Having quantified the environmental and foundation conditions along the pipeline route, the designer is then able to select the size, grade, and wall thickness of pipe required to satisfy installation and service conditions. Typically the grade and wall thickness chosen are a function of the installation procedure used and the site conditions (such as water depth, probable seastate at installation time, etc.) under

of pipeline leaks that have occurred can be directly traced to mechanical damage or to very rare and infrequent occurrences of natural phenomena rather than to failures attributable to design, service, or installation errors. In fact, this inherent safeness makes a well-designed pipeline the ideal means, from an environmental standpoint, for transporting oil and natural gas produced in a marine environment.

Natural conditions in the Gulf of Alaska will impose several difficult but not impossible constraints on the design, installation, and use of pipelines. Among these conditions are the rough sea bottom topography, the hostile weather, the earthquake potential, and the water depths in which potential hydrocarbon carrying basins of the Gulf of Alaska are located. One measure of this hostility is the probable cost of emplacing these pipelines. Costs of nearly $1 million per mile are often quoted for a typical twin pipeline system (two 12-inch pipelines at least 30 miles long) in place in waters not over 300 feet deep.

Because of geological conditions in the Gulf of Alaska, somewhat adverse sea bottom topography can be expected over some of the area. Adverse conditions such as boulder strewn and shifting sand sea bottoms are found in other offshore oil production areas. By proper design and installation procedures the effect of these can be minimized. For example, pipelines are now correctly functioning in both the Cook Inlet and the North Sea under similar circumstances.

Localized on-bottom current, tide, and wave effects must be determined prior to the installation of a pipeline. These effects could require the use of special anchoring devices, burial, or other special installation methods. Considerable precedence exists for the use of these techniques.

A potential for earthquakes exists in the Gulf of Alaska. The means by which to predict their occurrence, location, and magnitude is not yet well known. Fortunately pipelines have proven, in the past, to be relatively insensitive to the effects of major earthquakes. Ground shaking of itself is less hazardous than the hazard of crossing active faults and the hazard of landslides. During earthquakes on land, land slides are commonly responsible for much of the damage to surface structures. Submarine pipelines in the Gulf of Alaska would be routed as much as possible to avoid active faults and unstable slopes.

Hydrocarbon bearing pipelines have been successfully emplaced in waters over 400 feet deep and offshore pipelines have been placed in over 1000 feet of water. From the environmental viewpoint the depth of water in which a pipeline is laid is only important as far as the potential speed with which repairs could be made in case of line damage and resulting leakage. The relative harshness of the general climate in the Gulf of Alaska makes pipeline repair techniques rather depth insensitive.

As prudent operators it is only natural to expect oil companies to utilize the latest in pipeline safety and anti-pollution devices. This is doubly true in the Gulf of Alaska where the environment places such severe limitations on man's activities. Among these

2. The static (no flow) pressure in a pipeline located in deeper waters would most likely be less than the ambient hydrostatic pressure of the seawater around the pipeline. Upon shutdown the pressure in a ruptured line should quickly equalize to the ambient pressure upon initial product loss and subsequent losses should be relatively minor.

As with any venture involving hydocarbons in the offshore regime, there is a certain amount of inherent risk with the use of marine pipelines. This risk is illustrated by the pipeline oil spills of considerable magnitude that have occurred in the past despite the utilization of then current technology and operating plactices.[1] Prudent planning and operation dictate that these occurrences be minimized to a level consistent with the environment in which the pipeline exists. Present day OCS Regulations aid the offshore operator in achieving this consistency by defining minimum acceptable operating practices. In fact, these regulations (and associated orders, etc.) "are designed (according to the BLM) to prevent any major oil spill from occurring in OCS operations except through storm damage, equipment failure, operator error, or vessel collision." To reduce this possibility departmental regulations and orders generally require the use of more than one safety device in the various production systems.

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[1] "Systems Oil Spill Cleanup Procedures" prepared by George A. Gilmore, David D. Smith, Allen H. Rice, E. H. Shenton, and William H. Moser; Applied Oceanography Division, Dillingham Corporation, reported to the Committee for Air and Water Conservation, American Petroleum Institute, approved by Roy A. Gaul, Executive Vice President, Dillingham Environmental Company.

ONSHORE OIL TREATING FACILITIES

In choosing the location for an onshore facility, several things must be considered in this selection. The sites should be located near the beach so that the pipeline will be of minimum length and freight and equipment may be transported to the sites by sea if necessary. The terrain should be high enough to afford some protection from any potential tidal waves from earthquake action and yet it should be near enough to the beach so that a submarine pipeline may be brought ashore with a minimum of difficulty. The location should be situated so that an airstrip may be constructed. Items to be considered in this regard are available material, soil conditions and surrounding terrain. The airstrip should be approximately 5000 feet long to accommodate freighter type planes as well as smaller planes for personnel transportation. Beaches near the facility should be suitable for water-borne freight carriers. There are very few places along the Gulf of Alaska where facilities can be reached by road and this method of access to the facility for all practical purposes is disregarded.

The onshore facility should be so located that there is room for expansion in the future.

There are certain locations where communications are difficult; therefore, the site should be located in a position to provide good communications. The necessity of fresh water at any site is of utmost importance. The hydrology of the coastal area has had little study but water requirements for the small communities along the coastal area have presented a relatively minor problem due probably to the fairly high

GENERAL ENVIRONMENTAL DESIGN AND OPERATIONAL CONSIDERATIONS

Waste Water Disposal

Waste water on offshore platforms will originate primarily from the producing well stream. This and other sources of water will be processed prior to disposal. Treating of waste water will include measures necessary to meet water quality standards set forth by applicable regulatory agencies if the water is to be discharged into the Gulf of Alaska. The methods of processing the waste water for such discharge may include heating, coalescing, filtration, settling, and flotation. In some instances waste water may be disposed of by injection into the producing formations for repressuring and secondary recovery operations.

In those cases where crude oil processing facilities are located at onshore locations only free water will be separated and disposed of on the platforms. Water contained in emulsion with the oil will be removed onshore and processed for disposal utilizing equipment similar to that on the platforms. Disposal of the treated waste water at the onshore facility will probably be accomplished by discharge into the Gulf of Alaska. An alternative method of disposal of produced water at the shore site is to utilize subsurface zones if they are geologically and environmentally feasible and will accept the waste water with reasonably low surface injection pressures. The choice of the disposal method to be used will require a comprehensive study of the feasibility and economics of subsurface disposal versus

4. A mature risk assessment method and policy.

The selection of design criteria is based on integrated assessment of these items.

Seismicity

Seismic activity as revealed by earthquakes in the general area in and around the proposed OCS lease sale area is known to be fairly high. The locations and intensities have been recorded and documented[3] according to locations of epicenters and Richter magnitude. During the period from 1898 to 1961, 602 earthquakes greater than magnitude 5.3 occurred in or adjacent to Alaska. Most of these quakes occurred out along the Aleutian Islands and into the area around Cook Inlet. Records indicate that approximately six of these occurred in the proposed lease sale area. Between December, 1967, and October, 1969, records indicate three occurrences of earthquakes with an approximate intensity of magnitude five (5), with epicenters located within the proposed lease sale area and about fourteen others of a magnitude of four (4) or less. The most recent intense earthquake in the area occurred in March, 1964, and was one of three ever to be recorded in Alaska with an intensity of eight or more on the Richter scale. This quake resulted in much damage in the Anchorage area.

Existing platforms in the Cook Inlet have been analyzed for all environmental forces including earthquakes. Earthquake analyses

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[3] Davis, T. N. and C. Echols, Geophysical Research Report #8 (UAG-R131), 1962, Geophysical Institute, University of Alaska, College, Alaska.

the prospective platform location would be analyzed for load carrying capacity. Areas of very poor capacity would be avoided whenever possible. The topography of the bottom and the type material composing the slope as determined by coring would locate potential submarine slide areas. These areas would be avoided as potential platform erection sites. Marine geophysical tools have evolved to the point that they do a more precise job of mapping subsurface stratigraphy than those tools used on land. Part of this is due to the mobility of marine geophysical equipment allowing a more thorough coverage of a given geographic area. Relatively few fault lines have been found in the area of interest and these are considered to be inactive. Distance from the known active fault lines present in the Gulf of Alaska geologic province and earthquake epicenters generally influences magnitude of the ground motions during an earthquake. The further removed from the epicenters and active faults the smaller the ground motion.

Potential slide areas should be avoided when considering a fixed offshore facility. A potential slide area might be defined as an area composed of any material which may lie on a slope in a stable condition until disturbed by some rare and unusual phenomenon. It may be necessary for pipelines and power cables to be laid across active faults and potential slide areas, however it will be possible to minimize this through judicious selection of line routes. In instances where it is necessary to cross these problem areas, specially designed lines may be necessary. For example, one large line might be replaced with several smaller lines in order to achieve line flexibility thereby minimizing overstress or failure conditions.

Safety

In designing offshore structures for the Gulf of Alaska, safety is one of the most important criteria to be included. The Gulf of Alaska OCS Regulations concerning safety on offshore structures are in a final draft form (USGS) at this time. All structures installed in the Gulf of Alaska will meet applicable government regulations.

Reliable detection, alarm, and safety control systems will be used to protect offshore installations. The latest in technology and equipment will be employed to meet these requirements. The survival capsules have become a popular safety device on offshore installations in the Cook Inlet. These provide maximum protection for personnel working on offshore installations. This method of platform abandonment will probably be used in the Gulf of Alaska. Helicopters and boats will be utilized to evacuate the platforms in an emergency.

At the onshore facilities, as was the case on the offshore installations, alike safety systems will be employed throughout the installation. Remote operating capability will be utilized. Adequate fire fighting capabilities will be provided, utilizing a reliable water source and probably some type of dry chemical. The entire facility will be designed so that an accidental oil spill would be contained within the limits of the facility. This will include adequate impervious diking for the storage tanks on location as well as containment provisions for the treating vessels.

Logistics and Support

Transportation -- The most logical way to move heavy supplies and equipment to the Gulf of Alaska coastal area will be by ship or barge.

would be through the ports of Cordova, which is planned to be connected to the Highway system by the Copper River Highway, and Haines, which is presently connected to the Highway system. Equipment and material could be trucked to either of these locations and then barged to the work area.

Air transportation would play a major role in moving of personnel and smaller supply items. At present Yakutat, Cordova, Middleton Island, and Kodiak have scheduled air service and airstrips at their localities that can handle freight planes. Kodiak has a control tower, Cordova and Yakutat have a flight service station. The airstrips at Seward, Middleton Island and Cape Yakataga are gravel and can accommodate air freight planes but have no control tower and only limited landing aid facilities. There are numerous airstrips for light planes along the Gulf of Alaska coast. Many of these strips are maintained in useful condition by the FAA and are shown on the World Aeronautical Chart.

Undoubtedly the helicopter will play an important part in any operation along the Gulf of Alaska. Since it does not require a graded runway for landings and takeoffs, any open space including beaches is a potential heliport. Twin engine helicopters are now in domestic service equipped with instruments rated for blind flying. These units have a greater range than the single engine helicopters and are capable of staying aloft on one engine. This type of helicopter will greatly minimize the hazards of foul weather conditions that are often very local. This equipment would also reduce the hazard of long (possibly 30 miles or more) over-water transportation to the platform

be an impossibility and that the principal criteria would be the cost of the installation and maintenance of satisfactory service.

Telephone facilities are restricted to the following coastal area communities: Yakutat, Cape Yakataga Airport, Middleton Island, Kodiak, Valdez, Whittier, Cordova, and Seward. All of these centers are tied into the Alaska communications system. The system appears efficient with telephone calls to the Lower 48 being completed rapidly and with a minimum of trouble, and direct dialing is now possible. All work boats should be equipped with ratio-telephone and, if possible, should be able to communicate directly with the main and/or district headquarters.

Post offices are located at Yakutat, Cordova, Seward, Kodiak, Valdez, and Whittier. However, mail probably can be given to the pilots of planes that call at Cape Yakataga or Middleton Island for delivery to established postal offices, if necessary.

Base of Operation -- This type of facility must have sufficient flat or gently sloping areas to accommodate permanent living quarters, equipment housing, pipe ways, tanks, and an airstrip. The site must be on a protected body of water or on waters that are feasible for tanker or barge moorage and offer sufficient protection for the construction and maintenance of a small boat pier. A beach with relatively low cliffs is desirable in addition to a clear approach in the moorage area for tankers.

Living Site -- The most desirable off-duty living situation would be a site where families of working personnel could be accommodated. This would be a community with all facilities such as housing, schools,

located in the large glacial outwash planes and, if necessary, from the numerous streams originating in the adjacent mountain ranges. The water should be of fair quality although it could carry very fine sediment and a high iron content. Salt water intrusion could be a problem with wells that are drilled very close to shore. With the fairly high precipitation rate in the coastal area, wells and/or lakes or streams should have sufficient yield to supply the relatively small estimated need.

The availability of fresh water thus appears not to be a significant problem in the Gulf of Alaska geological province with the possible exception of Middleton Island. At the present time, water is obtained on Middleton Island from very shallow wells in the surficial deposits locally called "muskeg." There is no published information regarding the potential of this water supply but is is doubtful that it would be sufficient for a large installation even if a large amount of storage were provided. Middleton Island will require careful, hydrogeologic study before final selection as a base for a large operation provided that a fairly large reliable source of water is needed. It is probable that desalinization of sea water will be necessary if economics so indicate.

Air Pollution

After oil production has been initiated on a sustained basis, the fuel used to power the production platforms and all other facilities possible, such as those on shore, will be natural gas which is recognized as pollutant-free fuel. All applicable laws relative to air pollution will be complied with.

S T A T E M E N T

OF

LELAND E. WILSON

BEFORE

THE U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT HEARING

ON THE

PROPOSED OUTER CONTINENTAL SHELF
OIL AND GAS LEASE SALE

GULF OF ALASKA

_____, 1975

ANCHORAGE, ALASKA

Mr. Chairman, my name is Leland E. Wilson. I am a 1950 graduate of Tulsa University in Petroleum Engineering. Since 1950 I have worked with Atlantic Richfield Company, primarily in drilling and production activities. I am a registered Petroleum Engineer in the State of Alaska and have authored several technical papers on drilling and production. My experience includes eight years in the offshore areas of the Gulf of Mexico, four years in the Cook Inlet area and three years on the North Slope. For the past three years I have been associated with my company's operations in the North Sea. While the North Sea is not the Gulf of Alaska, there are many physical similarities between these two areas and certain of the operating conditions found in the North Sea will be present in the Gulf. For that reason, the experience of the industry in the North Sea is relevant to this hearing.

In my opinion the North Sea effort has clearly demonstrated industry's proven capability to explore and develop in a severe environment. However, it should be borne in mind that we will be entering the Gulf of Alaska very substantially better prepared, equipped and supported than we were when operations commenced in the North Sea. We will have more and better data on basic environmental conditions and structural design for the Gulf. This results from our industry programs relating to meteorology, oceanography, current data, weather forecasting,

wave hindcast evaluation, superstructure icing and, most importantly, on our evaluation of the significance of this data. We will be entering the Gulf of Alaska with capable, trained personnel and will be able to draw from a well developed and experienced oil industry related infrastructure of capable contractors.

(1) Index Map of the North Sea Area.

It was in 1964 that the governments of the various countries surrounding the North Sea began awarding exploration licenses. Early drilling was confined to the southern portion of the North Sea in water depths of less than two hundred feet. Large gas fields, including Leman Field, one of the largest offshore gas fields in the world with reserves of about ten trillion cubic feet of gas, were quickly discovered. Gradually drilling operations moved northward, and the first major oil field Ekofisk, was discovered in Norwegian waters in 1969. Other new oil fields were discovered at Forties, Josephine, Auk, and Brent, and new gas fields were found at Heimdal and Frigg. The northernmost drilling site of 62^{o} North latitude in the North Sea compares with a latitude of about 60^{o} North for the northern Gulf of Alaska.

(2) Slide of Fields

A total of 975 wells have been drilled in the North Sea since the beginning of leasing in 1964. Of these 975 wells, 725 have been exploratory holes. Of these exploratory wells, 520 were dry holes, 120 discovered gas and 85 discovered oil. Seventeen commercial gas fields and twenty-four commercial oil fields have been discovered.

The North Sea was quite different from other major operating areas where the industry had previously worked. The Gulf of Mexico, although certainly severe at times, did not generate the continual storm environment of the winters in the North Sea. There we have not only sea states of 65 to 85 ft. maximum waves, but we had added the conditions of extremely cold water, heavy swells from the mid-Atlantic and rapid development of storm conditions both from the North and West. Fog conditions were frequent and radio/communications/navigation systems were not as well developed in the North Sea as in the Gulf of Mexico. It is not unusual to have extended periods of downtime due to this wide spectrum of offshore problems, for example: one drill ship which we contracted for was essentially idle from November 15th to February 15th with almost no progress. The semi-submersibles which are better equipped to maintain operations under storm conditions have also been shutdown for weeks at a time due to one or more of the variety of conditions which can cause downtime. The Gulf of Mexico seldom shuts down rigs for such long periods although individual hurricane storms can be just as severe for short periods.

To search for and produce oil under adverse conditions new equipment had to be designed and built. One of the major tasks was to develop drilling and production platforms capable of withstanding the harsh sea and weather conditions. The early drilling in shallow water depths in the southern North Sea was accomplished from existing jack-up rigs. As drilling moved North into more severe weather

conditions and greater water depths, semi-submersible rigs such as are shown on these viewgraphs were used:

(3) SEDCO 135

(4) BLUE WATER III

(5) TRANSWORLD 61

These rigs were utilized in water depths up to six hundred feet and, in summer months, as far north as the Shetland Islands (refer to Viewgraph 1). Generally, these rigs returned to more southern drilling sites in winter months to allow for more efficient operations. However, as demand increased for year-round exploration, as well as for exploration in the far north (up to 62^{o} North Latitude), more sophisticated, heavy,semi-submersibles were built to cope with the sea and weather conditions:

(6) WAAGE II

(7) PENTAGONE DESIGN

(8) SEDCO 700

(9) AKER H-3

(10) PENROD 71

These rigs, some displacing upwards of 30,000 tons, can work safely in gale force winds and high sea states. They are capable of survival in one hundred foot seas and are able to continue efficient operations in twenty to twenty-five foot seas in water depths of over one thousand feet. Most are self propelled, use all-chain anchor systems, and have

crews of seventy to ninety men. Many of these rigs have sustained maximum wave heights of seventy feet and mean wind velocities of over sixty-five miles per hour. In the event of severe storms, a rig of this type can disconnect from the sea floor and ride out the storm, primarily because of its design which offers much less resistance to waves than does a ship shape. Most of this new generation of semi-submersibles are ocean going craft that can, and have, crossed the Atlantic under their own power or with only an accompanying tug.

(11) Illustration of Transparent Design

As of July 1, 1975 there are thirty-five semi-submersible rigs working in the North Sea from about Latitude 56^{o} North to 62^{o} North. It might be noted that all rigs and hull designs are carefully checked by qualified marine surveyors such as Det Norske Veritas, Lloyds, and the American Bureau of Shipping.

In addition to advanced drilling platforms, development of associated equipment has aided in operations in the North Sea and contributed to the fine safety record of these new rigs. For example, major advancements have been made in the design of Blowout Preventers and subsea equipment. Operators regularly use 10,000 psi working pressure equipment although little high pressure has been encountered. The newer equipment allows releasing from the sea floor safely, reconnecting and completely circulating the well prior to opening BOP's. Fail-safe valves, shear rams, redundancy on all safety systems and frequent tests have greatly improved the reliability of all this equipment.

Another major development greatly aiding operations in the North Sea has been better weather forecasting utilizing computers and satellites. These forecasts give us more lead time to prepare for storms and allow a prediction of their duration. Many operators use the London Weather Centre and independent contracting firms to give them twice a day forecasts or even more frequent if storm conditions are worsening. For example, our own Company uses a procedure whereby if weather forecasts are for twenty-five foot seas and/or forty-five mile per hour winds we discontinue drilling new hole, but may continue with other operations which are considered safe such as: logging or running casing. If wave heights are forecast to be greater than thirty-five feet we suspend all operations at the drill floor, pull and lay down sufficient drill pipe to allow the drill string to be hung off on the lower pipe rams with the bit inside the casing. If wave heights are expected to exceed forty-five feet or there is a vertical motion of the drill floor equal to or greater than fifteen feet we pull and lay down the riser pipe with the drill pipe still in the hole at the base of the last string of casing. In this position we are able to ride out the remainder of the storm or if we were moved off location by an anchor slippage it would not be too difficult or expensive to get back on to location again. It is very rare for the personnel to be removed from the rig since the vessel is seaworthy and designed to withstand up to one hundred foot waves.

In order to offset the long distances from operating bases it was necessary to greatly improve support transportation. Long range helicopters with large load capacities have significantly helped to alleviate the distance problem. These helicopters can quickly deliver

emergency supplies and technical assistance when needed. Specially designed supply ships with 1,000 ton cargo capacity are now common. In addition to moving large amounts of supplies in one trip, these ships can serve as anchor handling vessels, supply vessels, towing vessels and safety vessels.

(12) Viewgraph of Supply Boat

Increased storage areas on rigs also help to resolve the supply problem. The larger rigs can store up to 2,000 tons or more of variable loads of muds, cement, water and fuel, as well as items for human consumption. This increased storage capacity helps to prevent in-hole problems as enough materials can be kept on board to cope with emergencies until more supplies can be obtained.

Rigs in the North Sea are manned by much more than a driller and a few roughnecks. Highly trained technical personnel in numerous fields stay on board. On a typical rig in the North Sea will be found superintendents, both for contractor and company, geologists, drilling engineers, electricians, mechanics, sub-sea engineers, mud engineers, cementers, welders, weather observers, a complete marine crew, and a team of expert divers.

There is no doubt that those operating in the Gulf of Alaska will benefit greatly from industry's experience in the North Sea, including the mistakes that were made. For example, certain rig deficiencies noted in the early stages of the North Sea activity have resulted in significant

improvements in structural design, instrumentation, and inspection techniques which will provide much more reliable Units for the Gulf of Alaska than were available for the initial operations in the North Sea. Several rigs which were of inadequate design have failed to perform properly and one jack-up rig and one semi-submersible has been lost in storms. Inadequately designed rigs are now relegated to the Mediterranean and other milder areas. In addition one gas well went out of control and a relief well had to be drilled to control it, however no environmental damage was done during this blow out. Many of the lessons we have learned in drilling in the North Sea will be of benefit to the Gulf of Alaska operation, such as proper marine riser tension, use of motion compensators, proper storm draft, and improved anchor handling techniques.

The success of the North Sea operation reflects the proven ability of the oil industry to explore and develop in a hostile environment similar to that which will be encountered in the Gulf of Alaska. I believe it is reasonable to expect an even better personnel and equipment safety record in the Gulf of Alaska as a result of improvements initiated in the North Sea. Wells are now routinely being drilled East of the Shetland Islands at distances of 200-250 miles from the Aberdeen shore base which require 2½-3 hours helicopter flying time and 24-30 hours boat time each way. Sea temperatures are very similar to that of the Gulf of Alaska at between eight and nine degrees centigrade during the winter months. From what I have seen of the storm data of the Gulf of Alaska it appears that the same frequency of storms and similar sea states can be expected during the winter months.

It is a credit to the governments of the countries surrounding the North Sea and the industry that despite all of this activity no major oil spills or serious environmental damage has occurred. This outstanding record has been achieved even though the area was entered and initially explored with a lack of experience in operating in such an environment and without some of the more sophisticated technology and logistical support which will be available in the Gulf of Alaska.

In conclusion, let me point out that the North Sea is estimated to contain 30 billion barrels of oil reserves and 85 trillion cubic feet of gas reserves. Production should peak at about 2.8MM barrels per day of oil and 10 billion cubic feet per day of gas by 1980, thus making Norway and the United Kingdom self-sufficient. Hopefully, operations in the Gulf of Alaska will help move our country in the same direction. Based on my experience, I see no reason why the industry cannot operate safely and efficiently in the Gulf of Alaska.

(22)

DEPARTMENT OF THE INTERIOR

ALASKA OUTER CONTINENTAL SHELF (OCS) HEARING

BUREAU OF LAND MANAGEMENT

ANCHORAGE, ALASKA 99510

Outer Continental Shelf Draft Environmental Impact Statement
Proposed OCS Oil and Gas Lease Sale #39

Northern Gulf of Alaska
Anchorage Westward Hotel
Anchorage, Alaska

August 12-13, 1975

By
Herman Loeb
Director of Exploration Environmental Affairs

Pennzoil Company

Administrative Law Judge

Members of the Panel -- Ladies and Gentlemen

My name is Herman Loeb. I am Director of Exploration Environmental Affairs for the Pennzoil Company, and I live in Houston, Texas.

It is with a great deal of pleasure that we acknowledge the opportunity to take part in this Department of Interior Hearing which we believe to be a most important key to the future development of the petroleum reserves of this nation.

I would like to state at the outset that Pennzoil is an original member of the Gulf of Alaska Operators Group. We agree with the Group testimony and to avoid redundancy ask that the Panel observe and make note of our concurrence.

We are primarily a natural resources company. Pennzoil Companies are engaged in the exploration and production of oil and gas, copper, sulphur, potash and associated minerals, the sale and marketing of these products.

One of the main thrusts of our corporate efforts is in the field of exploration and a great deal of our personnel and financial planning has been directed to the search for additional reserves of oil and gas. Our management for a number of years has pressed for a firm dependable schedule for OCS leasing, and this Environmental Impact Statement and Hearing with it's accompanying schedule, certainly is a forward step in this direction.

The results of the Department of Interior priority poll as to resource potential rated the Gulf of Alaska as the top choice in the "frontier areas." We believe this poll to be a valid one and concur in this choice.

Pennzoil has for some time been interested in the Alaskan region. As early as 1967, we drilled two wildcats in the Cook Inlet and know first hand of the problems that accompany such an effort. At that time we as well as the rest of the industry worked diligently to prepare for additional sales in the Lower Cook Inlet and the Gulf of Alaska. Nominations were solicited but as we all know, additional OCS sales in the aforementioned areas were never scheduled. It should be remembered that many man hours of exploratory work, seismic and surface as well as subsurface were conducted in anticipation of a sale. We participated heavily in this effort. An Anchorage office was opened in 1970 but due to incumbent delays was closed at the end of 1972. We believe now as we did in 1967 that oil and gas exploration and development can be conducted in the Gulf of Alaska within the existing rules and regulations. We believe that industry has the expertise to adequately protect the environment and to continue its search for urgently needed additional fossil fuels.

However, since the "frontier area" terminology became accepted in President Nixon's Energy Message in the Spring of 1973, a number of extremely important events that have vitally effected this nation's energy resource potential have occurred. To review the chronology

would serve no useful purpose but the documentation of the exploratory effort, we believe to be worthy of note. The long range optimistic approach assumed that hydrocarbon accumulation could be expected in the aforementioned OCS areas, i.e., Northeast Gulf of Mexico, further seaward areas off the Louisiana and Texas coasts, deeper waters off Southern California, the Atlantic offshore, and the Gulf of Alaska.

One of these five areas, the Northeast Gulf of Mexico (Mafla Area) has been drilled and to date results have been discouraging. Recent sales for deeper water tracts off the Texas and Louisiana coasts have been light compared to previous sales indicating possible doubts in regard to commercial accumulation.

The main point is that simply we don't know whether hydrocarbons exist in these four remaining areas. The best geology in the world, ladies and gentlemen, is a little luck and we're going to need plenty of it when we drill these areas. This nation cannot afford to delay exploration in these unknown areas. If no accumulation exists, the sooner we know the better. We believe industry has the expertise to drill and explore in these frontier areas, and Pennzoil welcomes the opportunity to join the rest of industry in taking the financial risk.

As an exploration company, we think it is our primary objective to find new reserves that will make this country less dependent on foreign sources. The leasing of additional "frontier areas" is the most direct, logical and secure method of achieving this objective.

Since 1970 when the Pennzoil Board made the decision to acquire a major position in the Gulf of Mexico OCS, we have accomplished the following as of August 1975:

1. Participated in the last thirteen (13) OCS sales with 47 other companies and obtained interest in 84 offshore tracts.* These groups expended in excess of $1.7 billion of which Pennzoil affiliates contributed $491 million.

2. Within the Gulf of Mexico, Pennzoil and its affiliates have drilled or participated in the drilling of 355 exploration and development wells at a net cost of approximately $103 million.

3. Have set or announced intention to set 27 production platforms on 20 tracts.

4. Have five (5) blocks now on production at a combined gross daily rate of approximately 760,000,000 cubic feet gas and approximately 47,000 barrels of oil and condensate.

The above was accomplished under the existing parameters of OCS Land Act and present State regulations. It is quite apparent that our interest is indeed focused on additional OCS development and future sales.

In conclusion, we would like to stress that our offshore operations were conducted within the existing regulations of the state and federal government and with the constant awareness and protection of the environment. We fully concur that this can and must be done. We look forward to communication and cooperation with the Department of Interior and other state and federal agencies as new areas of the OCS become

*Two tracts dropped - final confirmation on two additional tracts from July 29, 1975 sale still pending.

available. Finally, we welcome the opportunity along with the rest of industry to lease and develop OCS tracts in the Gulf of Alaska with full knowledge of the financial and exploratory risks involved. We believe that these new areas should be leased and that additional reserves will be discovered.

(23)

STATEMENT ON PROPOSED LEASE SALE NO. 39

OUTER CONTINENTAL SHELF

GULF OF ALASKA

DEPARTMENT OF THE INTERIOR HEARING PANEL

AUGUST 12 - 13, 1975

OF

R. W. BYBEE

EXXON COMPANY, U.S.A.

STATEMENT ON PROPOSED LEASE SALE NO. 39
OUTER CONTINENTAL SHELF
GULF OF ALASKA
DEPARTMENT OF THE INTERIOR HEARING PANEL
AUGUST 12 - 13, 1975

R. W. BYBEE
EXXON COMPANY, U.S.A.

Mr. Chairman and members of the panel. I am R. W. Bybee, Exploration Department Operations Manager of Exxon Company, U.S.A. My duties include direct responsibility for my company's exploration activities in all domestic offshore areas. It has been my privilege to participate in your hearings on the Gulf of Mexico and offshore California, and I am very happy to have the opportunity to meet with you on this occasion.

Industry, through the Gulf of Alaska Operators Committee, has made an indepth study of your draft environmental statement, and is presenting comprehensive testimony in response to your invitation to comment. Exxon, as an active participant on the committee, endorses the statements made by committee representatives at this hearing.

It is not my intent to duplicate any of these statements, but I would like to comment briefly on three matters pertinent to this discussion:

First, you have identified the extent of industry interest in the Gulf of Alaska as one of the subjects to be developed at this hearing. It is apparent that industry has a great interest in this sale, on the basis of the No. 1 ranking it gave to the Gulf of Alaska in response to your request for a petroleum potential ranking in frontier areas. Exxon believes the Gulf of Alaska is a prospective area for petroleum exploration and urges that proposed Lease Sale No. 39 be held without delay.

Second, Exxon has been a responsible corporate citizen of Alaska since our first geologic crews initiated their exploratory efforts in the mid-1950's. We recognize our responsibilities of corporate citizenship and affirm that in any future operations we will continue to cooperate with the appropriate State and Federal regulatory agencies as well as local community organizations to ensure that our operations will be compatible with the environment and allow multiple usage of the Gulf of Alaska waters.

Third, Exxon and the industry have demonstrated the technical capability of safely conduct exploratory and development operations in the Gulf of Alaska. The petroleum reserves that have been discovered on the outer continental shelves of the free world result, to a large extent, from American technology which was initiated in the Gulf of Mexico a quarter of a century ago. Since that time, refinements and improved technology have permitted drilling and producing operations to proceed in increasingly difficult environments.

A good example to illustrate the sophistication of our current technology is the North Sea, where substantial petroleum reserves have been discovered and developed under weather and sea conditions similar to those in the Gulf of Alaska. We are confident that we can operate safely and effectively in the Gulf of Alaska.

I would like to emphasize that exploration and production activities can be conducted in a manner compatible with the environment in this area.

The U.S.G.S., in cooperation with the industry, has developed regulations under which extensive exploration and production operations have been safely accomplished. Exxon has operated in a safe and responsible manner in California, the Gulf of Mexico and most recently in offshore Florida.

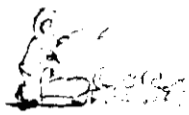
In conclusion, Exxon strongly recommends that Sale No. 39 be held *without delay*. We are confident that the resulting activity will benefit our Nation, the State of Alaska, and the local communities including their citizens in the Gulf area.

(24)

TELEX 09025-138

Alaska Bussell Electric Company

"AN ALASKAN CORPORATION"
ELECTRICAL CONTRACTORS



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My name is Roger Spencer, Vice President of Alaska Bussell Electric Company, an Alaskan Corporation.

I will leave it to those who employ statisticians and economists -- and computers -- to explain the nation's dependence on fossil fuels, which I am convinced is the case.

And surely there are those here more qualified than I to state again the dangers of over--dependence on unreliable foreign sources for our oil and gas needs -- and I am convinced that these dangers are real.

I will confine my remarks to what I can testify to from personal experience.

First of all, I know that oil and gas development has been good for this state's economy. I have experienced it, and so have the great majority of those I know in the state.

I am convinced that when at all possible the oil companies use local employees and local businesses. As a matter of fact, my firm was not fully qualified to serve the full needs of our oil company clients in the beginning. I was sent outside for special training so that my firm would be more qualified. That the oil companies gave us time to do this rather than bring in outsiders is noteworthy, in my view.

My personal experience in this regard is not unique. Alaska Bussell Electric has more employees by far than would be the case were there no oil development in Alaska. And our employees, hired

locally, have far greater opportunities to learn new skills and to advance within our organization. There are scores, perhaps hundreds, of other such small businesses in Alaska today that are prospering because of oil development.

I could not, in good faith, speak for oil and gas development if economic considerations were not balanced against other aspects of life in Alaska. For example, the environment.

There are two things I know about the oil industry's concern for the environment. One is that the oil companies treat our environment with greater care than do any others I can think of. That includes sportsmen, tourists, homesteaders, Natives, fisherman, sourdoughs and cheechakos.

I can show you examples of this by the dozens right here in Anchorage or in any other community or village in Alaska that I am familiar with. For instance, sewage treatment effluents from camps along the Trans-Alaska Pipeline route are checked for efficiency and if all isn't well, Alyeska gets slapped with fines and adverse newspaper headlines. The other side of the coin is that most communities in the state have inadequate sewage treatment facilities -- or, as is more often the case, they have no sewage treatment at all.

The other thing I've observed which convinces me that oil companies are working to protect the environment is the attitude of their employees.

My work takes me to the platforms in the Cook Inlet and I have never seen an employee who was not conservation-minded. Most are sportsmen and some have commercial fishing interests. These are the kind of people who instinctively refrain from throwing even a candy wrapper off a platform -- and they are the same folks who would never think of throwing a beer can out of their car when back in Anchorage.

To believe these same people would operate carelessly so as to let oil get into the waters around their platform just wouldn't make sense.

All I'm trying to say is that oil and gas development has been good for Alaska and if the environment is suffering, we should look elsewhere for the culprits.

I strongly urge that the proposed lease sale in the Gulf of Alaska be carried out.

Roger D. Spencer

Roger D. Spencer

4/12
25

June 30, 1975

Director
Department of the Interior
Washington, D.C. 20204

Re: City of Whittier Position Statement, of oil & gas leasing on the outer continental shelf.

Dear Sir:

The City of Whittier strongly endorses the Department of Interior Plan to explore and develop potential oil and gas sites on the nations outer continental shelf. We favor the early exploration of the Gulf of Alaska.

We are aware of the ctiyical position the nations is in at this time in regard to the petroleum and natural gas needs both for the present and future.

We cannot visualize how a national energy policy can be developed and implemented without an accurate assessment of the resources available. Current estimates by the U.S. Geological Survey and the Alaska State Division of Geological Surveys are of necessity speculative. We believe that speculative element should be removed and national energy management be developed based on known reserves. This knowledge can be obtained only by test drilling in areas showing favorable geophysical and geological characteristics.

We know that the oil companys have the expertise to safely operate off shore drilling rigs, from the experience they have gained by operations in the Gulf of Mexico and the North Sea.

We do not see an incompatibility of fishing and oil leasing activities in the Gulf of Alaska. On the contrary, subject to results of additional environmental studies, I

believe the activities are complementary, both that the fishing industry is dependent on the petroleum industry for its energy source and that additional jobs created by oil leasing will create jobs necessary to diversify our economy.

Very truly yours,

C. Ross Wood

C. Ross Wood
City Manager

CRW:sl

DRAFT STATEMENT

21

Mr. Chairman, Committee Members

~~GOOD AFTERNOON. MR. CHAIRMAN.~~ I AM ROY ROBINSON, PRESIDENT OF THE ALASKA BROADCASTERS ASSOCIATION, and General Manager of KFI immediate past I WOULD LIKE TO COMMENT ON THE OIL INDUSTRY DEVELOPMENT IN ALASKA WITHIN A CONTEXT THAT I AM FAMILIAR.

WHEN THE MODERN OIL INDUSTRY MOVED INTO ALASKA A LITTLE MORE THAN 15 YEARS AGO AND ~~SETTLED DOWN~~ headquartered IN ANCHORAGE, THIS COMMUNITY HAD THREE RADIO AND TWO TELEVISION STATIONS. THE LIVE RADIO-CASTING OF SOME NATIONAL EVENT WAS then THE SUBJECT OF MUCH PROMOTION AND CONSIDERABLE COMMENT. TODAY, THERE ARE ~~EIGHT~~ 9 RADIO AND FOUR TV STATIONS HERE AND LIVE TELECASTS FROM AS FAR AWAY AS OUTER SPACE ARE BECOMING ALMOST COMMONPLACE.

I HASTEN TO ADD THAT I DON'T ATTRIBUTE THIS REMARKABLE INCREASE IN THE INFORMATION AND ENTERTAINMENT MEDIA DIRECTLY TO THE INFLUENCE OF THE OIL INDUSTRY.

BUT OIL COMPANIES HAVE BEEN IN THE FOREFRONT OF SPONSORS FOR PUBLIC SERVICE AND LIVE SPORTS BROADCASTS. AND, WITHOUT THE POPULATION AND ECONOMIC GROWTH GENERATED LARGELY BY THE OIL INDUSTRY DUING THE PAST DECADE OR SO, THE EXPANSION IN COMMERCIAL BROADCASTING SIMPLY WOULD NOT HAVE BEEN POSSIBLE.

THE ~~POINT~~ thing I WISH TO ~~MAKE~~ stress IS THAT THE GROWTH IN THIS PARTICULAR COMMERCIAL SECTOR, AND I SUSPECT A LOT OF OTHERS, WOULD NOT HAVE BEEN NEARLY SO GREAT WERE IT NOT FOR THE SUBSTANTIAL REVENUE GENERATED BY THE OIL INDUSTRY PRESENCE HERE.

MORE

BUT THERE IS SOME CONCERN ALREADY BEING EXPRESSED THAT THERE MAY BE A SHARP DROP IN ~~THE~~ THIS PROSPERITY WHEN THE ~~TRANS~~ TRANS-ALASKA OIL PIPELINE CONSTRUCTION IS COMPLETED AND EMPLOYMENT IS EXPECTED TO ~~XXXXX~~ UNDERGO A STEEP DECLINE. SMALL FIRMS COULD BE BANKRUPTED AND CERTAINLY THE LEVEL OF COMMERCIAL SERVICES WOULD BE SIGNIFICANTLY LOWERED, SHOULD THAT OCCUR.

I AM TOLD, HOWEVER, THAT THE RESERVES OF THE ALASKAN GULF ARE EXPECTED TO RIVAL THOSE OF THE NORTH SLOPE AND PERHAPS EXCEED THEM. IF THAT IS TRUE, AND IF WE BEGIN EXPLORATION IN THE NEAR FUTURE, THERE WOULD BE AN ORDERLY ~~XXXXXX~~ TRANSITION OF ACTIVITY FROM ONE ~~XXXXXX~~ AREA TO THE ~~XXXXX~~ OTHER WITHOUT ANY SEVERE AND UNNECESSARY ECONOMIC DISRUPTION.

IT WOULD SIMPLY BE GOOD BUSINESS TO GO AHEAD WITH LEASING IN THE GULF OF ALASKA ~~AND EVERYTHING I HAVE READ RECENTLY INDICATES~~ Recent reports THE NATION BADLY NEEDS ANY NEW OIL OR GAS THAT MAY BE FOUND ~~XXXXX~~ THERE.

THANK YOU, MR. CHAIRMAN, LADIES AND GENTLEMEN.

alaska
AIR CARRIERS
ASSOCIATION, INC.
BOX 84-9
ANCHORAGE ALASKA 99502

STATEMENT ON LEASE SALE ON THE
OUTER CONTINENTAL SHELF OF ALASKA

JAMES M. DODSON JR.
EXECUTIVE DIRECTOR

ON BEHALF
OF THE MEMBERSHIP OF THE ALASKA AIR
CARRIERS ASSOCIATION, INC. AUGUST 12, 1975

My name is James M. Dodson Jr. I am here this evening on behalf of the membership of the ALASKA AIR CARRIERS ASSOCIATION, INC., a wholly Alaskan Trade Association of Commercial Aviation Carriers, both fixed wing and Helicopter, from every part of this state. I am here to speak in support of an early lease sale on the Outer Continental Shelf of the Gulf of Alaska.

Our Association consists of 87 Air Carrier firms who account for an estimated 75-80% of the gross aviation revenues reported to our state Transportation Commission, which last year exceeded $70 million dollars. Of the roughly 1098 aircraft in commercial service in Alaska, my membership operates about 65-70% and employ about 1600 Alaskans.

Our membership vividly recalls the winter of 1973-74 when they suddenly found themselves without assured fuel supplies to continue there service to the public. I don't know who was more concerned about this situation -- the aircraft operators, or the people in the bush who have a near life-and-death dependency on the air transportation services we provide. None of us look forward to a repetition of that potentially disastrous situation.

- More -

The United States has the potential oil and gas reserves to avoid that kind of crisis shortage in the future, if we go ahead now with exploration and development of those potential supplies. Alaska's Off-Shore area in the Gulf of Alaska is one of those areas which should be given the go ahead for exploration and development, now, so that this country can be assured we will never again be humiliated by a small block of oil exporting countries using their petroleum as a weapon and Alaska's population, even though small, can be assured of the continuation of their lifestyle in the remote areas because they will have an air transportation system.

I have been hearing over the past week, in the press, a plea to study the Gulf of Alaska Off-shore oil development more--that we should let the east coast states, who need the oil, develop their off-shore areas first. I believe this to be a classic example of "dynamic inaction and creative delay" as defined in Dr. James Boren's excellent handbook for bureaucrat's, "When in Doubt, Mumble". I don't believe we can better our environmental protection knowledge through "appropriate pondering" any more then we can solve the over-population problem by studying the human gestation period, hopeing, through studied delay, to extend it to 18 months.

The oil companies and the Federal government have been studying the potential of the Gulf of Alaska for at least seven years. I understand the oil potential of the Atlantic continental shelf was just realized in the last two or three years. I am told

the Gulf of Alaska has the greatest geological potential and knowlegable oil people say, on the basis of the years of study, they are, technically ready to proceed here, safely and with knowledge of environmental difficulties they will encounter.

If this is true then it certainly makes sense to me to proceed with exploration in the Gulf while getting ready in the Atlantic. It also makes good sense to me to go ahead with an orderly, steady exploration and development program in Alaska, rather than put up with the economically devastating fits and ~~state~~ STARTS situation we have had in the past as a result of lawsuits and indecision on the part of Public decision makers. Our boom and bust cycles of late in Alaska have been produced, not by market conditions, but by indecision. The small businessman in Alaska, which all my members are, can deal with market conditions, but not bureaucratic indecision and fingertapping.

Alaska has the resources the nation needs for our future security as well as a continuation of our life-style. The longer we delay developing them the more we endanger both our security and life-style.

I thank you for your time.

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(29)

Good morning. My name is James Malapanes, representing Bricklayers Local No. 1 of Alaska. I am here to urge the federal government to proceed with oil and gas leasing in the Gulf of Alaska because I believe it is in the best interest of the nation, the state of Alaska, and certainly, it will be to the economic advantage of the working people in this state.

I read news stories predicting gasoline shortages around the United States this summer and there are regular dire predictions of serious heating fuel shortages next winter, particularly in the eastern United States. Workers in industry and commerce will be the first to feel the blow of fuel rationing because their places of employment will be the first to be cut off, except a few vital service industries.

As for Alaska unemployment, the state is now in the greatest period of economic prosperity in history and yet one-twelfth of its work force is unemployed. During winter, and particularly in the construction trades, this can rise to more than one-half.

The only way any real improvement and balance can be brought to Alaska's employment situation will be through creation of jobs as a result of commercial and industrial development. I realize that leasing and oil exploration in our outer continental shelf areas won't create many jobs or solve next winters fuel problems for the United States.

But if large oil fields are found, the nation will have another reliable source of some badly needed petroleum and Alaska must inevitable experience development of processing and petro-chemical plants which will provide stable, year-round employment.

I know my union won't get any work directly from any oil development in the Gulf of Alaska. But I do know that it takes a lot of energy to produce the tools and materials with which we work. I also know that there isn't very much new construction work to be had in times of economic recession.

To that extent, my reasons for supporting the lease sale may be selfish. If so, I'm not ashamed to admit it.

I thank you for your time.

(30)

SAM KITO
President, AFN, Inc.
August 13, 1975

TESTIMONY

ENVIRONMENTAL IMPACT STATEMENT

FOR THE

GULF OF ALASKA OIL SALE

The Alaska Federation of Natives at it's Board of Directors meeting on July 24, 1975 passed the following motion, "that AFN take a position on the upcoming Outer Continental Shelf lease sale, that the sale be delayed." The Alaska Federation of Natives feels strongly that the Environmental Impact Statement prepared by the Bureau of Land Management for the proposed northern Gulf of Alaska lease sale is totally inadequate. We are strongly opposed to the government rushing headlong into an OCS leasing program in the Gulf without adequate assessment of the socio-economic onshore impact of oil development. We are also concerned that some of the offshore impacts have not been adequately addressed.

The Environmental Impact Statement is filled with statements that leads one to believe that the Department had very little information on which to base their conclusion. As a matter of fact, the section on environmental impacts of the proposed action begins with the following sentence - "Much of the impact data on which this section was based was, generalized, incomplete and not specific to the Gulf of Alaska." It seems to us that there can be no more damning criticism of the EIS than the Department's own words quoted above. We find other similar statements in the EIS as follows:

1. "There are no published studies on phytoplankton species distribution for the proposed area..." page 102
2. "The rugged coastline of the Gulf of Alaska is not well known, and very few of its shores have been described sufficiently to be of any correlative value to ecological studies completed on them." Page 107
3. "There are no published studies or surveys of the marine vegetation in this area." page 111
4. "There is little logic at this time on which to assume the geographic distribution of these facilities or the period of time and the given so the facilities will remain in service." page 542
5. "The actual adverse affects on the fish and the fisheries will depend on a number of factors that are not at present known..." page 572
6. "Presently unknown impacts could be avoided or reduced, but until all studies are completed and analyzed impacts can only be speculative." page 749

The above list is not in no means exhaustive, but we think it points out the deficiencies that exist in the Environmental Impact Statement. The Department indicates on page 748 of the Impact Statement, that a delay of approximately one half to two years "would allow for completion of all pre-operational phases of the environmental studies program in the northern Gulf of Alaska and realize the objective stated earlier." If this time is needed, we cannot understand why the Department does

not take it. There must be a delay in order to get a true assessment of the potential onshore impact of small communities on the Gulf of Alaska.

ENVIRONMENTAL IMPACTS

The Alaska Federation of Natives does not have the technical expertise to comment on some of the scientific factors addressed in the discussion of potential environmental impact. However, we do think there are a number of points that need to be raised. The most important point is that the EIS does not link potential negative environmental impact to lifestyle of people who live onshore. For instance, Tlingit Indians living in Yakutat use both seaweed and herring eggs as part of their subsistence diet. There is no mention of this anywhere in the Impact Statement or the negative impact on the lifestyle of the people should these resources be seriously reduced as a result of any oil spillage. The EIS does not address the potential negative affects of serious reductions in fish, shell fish, clams and other sea resources on the life styles and subsistence living patterns of people living in small communities should major oil disasters take place.

The Environmental Impact Statement also ignores the potential devastating effect of a large increase of population on the fish and wildlife populations. Large increases in population in places like Yakutat, Cordova, Tatitlek, Chenega, and other small communities could seriously reduce populations of moose, deer, fish, and other resources, if the individuals employed in construction and development activity are allowed to compete for subsistence resources that are already becoming scarce.

A recent survey in Yakutat has shown 60% of the people living in the area get between 25 and 50% of their food from subsistence activities. These activities include both Natives and non-Natives and a major reduction of subsistence resources either through oil spillage or over-hunting and fishing resulting from major increase in population would have disastrous negative impacts on the lifestyle of the people of the community.

ONSHORE SOCIO-ECONOMIC IMPACTS

Without question, the weakest section of the EIS is that dealing with Onshore Socio-Economic Impacts. Not only are the discussions about onshore impact of a superficial nature, but many of the assumptions may seem to be ill conceived, if not ouright ludacrist. For instance, on page 595, the Bureau of Land Management makes the incredible assumption that because in 1970, Anchorage had 79% of the population of the places that might be impacted by the OSC sale, that Anchorage will have 79% of the population impact from the Outer Continental Shelf development itself. There is just no basis for this kind of an assumption and as a matter of fact, it is pretty clear that Outer Continental Shelf development cannot take place unless there is considerably more population increases in small communities than the Department presently projects. The population figures discussed on page 592 are warped in another manner. Kenai-Cook Inlet census figures are thrown into the base formula when it seems unlikely that Kenai-Cook Inlet will receive much impact if any, from the northern Gulf sale. There seems to be informed consensus that the primary communities to

be impacted would be Seward, Whittier, Cordova, and Yakutat. It is conceivable that new cities might be developed at some other places.

On page 592, the Bureau of Land Management also makes the assumption that there will be no impact in Yakutat until 1978 and then there will only be 3 people coming to Yakutat as a result of the OCS lease sale. One could laugh at these figures, if they did not bode such potential tragedy for small communities such as Yakutat. There are already more than three people in Yakutat as a result of the Gulf sale and it hasn't even taken place yet.

On page 704, the EIS states "Only if population inducements rise significantly above those projected in this draft EIS, will Yakutat have it's traditional, Native, cultural lifestyles threatened." As we've just pointed out, the population figures are already wrong and the sale hasn't even taken place yet. The Department of Interior states in several places that local planning procedures must be implemented in order to avoid impact. However, if you use the Department of Interior population figures, the amount of planning needed is negligible. Certainly, Yakutat would not have to do a great deal of planning to accept a maximum of 115 people projected by the Department of Interior for Yakutat and Icy Bay. The Department of Interior is doing a great disservice to these communities by not providing accurate information on which the communities can base their planning.

We would also disagree with the assumption on page 704 that "The Bureau has no direct authority to mitigate what CEQ (1974) called

"unnecessary disruption of traditional values and lifestyles". "But that such authority and responsibility rests with the state and local officials at various administrative and regulatory levels." First of all, we believe that the Department of Interior has an extensive responsibility to these people. Not only does the Department have a responsibility because the impacts are taking place as a result of a sale made by the federal government, but in the case of Yakutat and other small communities with significant Native populations, the Department of Interior has a trust responsibility to those Natives to protect them from a destruction of their lifestyle.

Yet, the Department of Interior is doing absolutely the opposite. They are providing the communities with information that is incomplete, inaccurate and at times outright fallacious, and this information is useless for good planning. It seems to us that the population impact figures used by the Council on Environmental Quality are much more realistic and provide for possible impacts of a five to ten fold increase in Yakutat. One of the basic problems in all the discussion of potential impact on small communities is that until the exploration phase has been carried out, it is virtually impossible to project the full impact of the lease sale on these communities. There is no question that there will be some impact from exploration, but the development phase could bring absolute total devastation to the life-style of the communities like Yakutat if major pools of oil are found near the community and if the assumption that BLM makes about the construction of oil rigs out of state proves to be false.

The oil rig construction assumption is a very dangerous one because if the BLM is wrong, then a small community which is targeted for the construction for concrete platforms in state would have thousands upon thousands of workers on these projects. The Bureau of Land Management does not even deal with this as a possibility in their Impact Statement which is just another example of how shallow the Environmental Impact Statement is.

We already know, for instance, that there have been impacts other than population impacts in Yakutat. Land prices have risen considerably because of a major land purchase by oil companies in the middle of town. We have also seen a split in the community as a result of the potential for the lease sale. There is a portion of the community who want to develop now at any cost, whereas, there is also a faction who says we need to wait and plan for what could be a devastating onslaught as a result of the development. Unfortunately, most of the pro-development people are basing their stand on the inadequate population figures which the Bureau of Land Management and the oil companies have been providing. It is clear from the recent survey in Yakutat that even most of those individuals desiring development do not want to see the community of Yakutat grow much beyong 1500 people. The construction of one concrete oil drilling rig would result in a population increase of 2200 people on a temporary basis.

CONCLUSION

In conclusion, we would like to say that at this point, we do not see how the Bureau of Land Management can in good faith proceed with the

sale based on the draft Environmental Impact Statement. There is no question that the Department of Interior has been treating this Impact Statement as a necessary evil which must be dealt with as a written document, but which has absolutely no affect on the Department's decision to lease. Unfortunately, the Environmental Impact Statement cannot come to any rational conclusions about leasing because it is no based on any good assumptions.

Throughout the document, the Bureau of Land Management refuses to share the burden for any of the onshore planning that must take place because of the OCS lease sale, but rather places the entire responsibility on the shoulders of the state and local governments. Then, in the same breath, the Bureau of Land Management turns around and forces a lease sale upon state and local governments before they are ready to plan and work with the major developments that could take place. Even if the oil finds in the Outer Continental Shelf are as large as the government hopes, the impact on national consumption of oil will be practically negligible. It is difficult for us to see why a delay in the lease sale in order to deal with these problems could have any significant, negative impact on the rest of the country.

Finally, if the Department does not find conclusions to it's own questions that were raised throughout the EIS, AFN will attempt to resolve these issues through litigation for the protection of life-styles that could be affected by OCS development.

THANK YOU, MR. CHAIRMAN. MY NAME IS TAMARA CARR. I AM A MEMBER OF THE ALEUT CORPORATION, PRESIDENT OF ARCTIC-PACIFIC, INC., A MINORITY CONSTRUCTION FIRM, AND I AM A PROFESSIONAL REALTOR.

IT IS IN ALL OF THESE CAPACITIES, AND AS A CONCERNED ALASKA CITIZEN THAT I COME HERE TODAY TO SPEAK IN SUPPORT OF THE PROPOSED OIL AND GAS LEASE SALE BY THE DEPARTMENT OF THE INTERIOR.

ALASKANS, AND PARTICULARLY NATIVE ALASKANS, NEED BETTER HOUSING, BETTER COMMUNICATIONS, BETTER TRANSPORTATION, AND ALL OF THOSE THINGS MOST ALL AMERICANS TAKE FOR GRANTED. HOUSING STANDARDS IN RURAL ALASKA, FOR EXAMPLE, ARE ON A PAR, IF NOT BELOW THE DEPLORABLE LEVEL OF THE NAVAHOES. HOUSES, AIRPORTS, BOAT HARBORS AND SATELLITE STATIONS CAN BE BUILT. BUT THIS WILL REQUIRE MONEY AND ENERGY....LOTS OF IT.

ALSO, ALL OF THESE GOOD THINGS OF LIFE WILL HAVE NO MEANING FOR THE AVERAGE ALASKAN, EVEN IF THEY ARE BUILT, UNLESS WE HAVE THE MONEY TO SHARE THEM. THERE WAS NATURAL GAS HEAT A POINT BARROW LONG BEFORE THE FIRST ESKIMO HOMEOWNER BEGAN ENJOYING IT. INDOOR PLUMBING CAME TO BETHEL YEARS BEFORE ANY NATIVE FLUSHED A TOILET.

THERE WERE WITNESSES YESTERDAY WHO TOLD YOU THAT PETROLEUM DEVELOPMENT DOES HAVE A POSITIVE IMPACT ON SERVICE COMMUNITIES BY BRINGING ABOUT IMPROVED TRANSPORTATION AND COMMUNICATIONS FACILITIES. I BELIEVE THAT.

MORE

THESE IMPROVEMENTS ARE DESIRABLE AND NECESSARY THROUGHOUT ALASKA TO BREAK OUR AGELESS PATTERN OF SINGLE RESOURCE DEVELOPMENT. WE HAVE ALWAYS BEEN A ONE-RESOURCE LAND, ALTHOUGH THE PRIME INCOME HAS VARIED FROM FURS TO GOLD TO FISH TO MILITARY AND CONSTRUCTION. IT'S ALWAYS BEEN BOOM OR BUST DEPENDING ON THE HEALTH OF THE ONE RESOURCE.

NOW, WE HAVE PETROLEUM DEVELOPMENT, BUT WE STILL FACE THE NEED FOR A DIVERSIFIED ECONOMY...

WE HAVE THE OPPORTUNITIES NOW TO USE THE SUPPORT FACILITIES DEVELOPED BY AND FOR THE OIL INDUSTRY TO BUILD UP OUR INCOME FROM TOURISM, TIMBER AND MINING. WE NEED MORE THAN ONE WAY TO BRING REVENUES TO THE STATE. WE NEED A DIVERSITY OF ECONOMIC INTERESTS TO BREAK THE SUBSISTANCE LIFESTYLE.

IT IS DIFFICULT FOR ME TO DISCUSS THE ALASKAN LIFESTYLE WITHOUT A VERY PERSONAL FEELING ABOUT THE APPARENT ROMANCE THAT SOME PEOPLE ATTACH TO LIVING OFF THE LAND.

LIVING OFF THE LAND... A SUBSISTANCE STYLE OF LIFE... IS A GOOD LIFE, IF THAT'S WHAT YOU CHOOSE. IF YOU CAN MAKE A LIVING IN SOME OTHER MANNER THAN HUNTING AND FISHING...AND YOU CHOOSE TO HUNT AND FISH, THAT IS FREEDOM. IF YOU LIVE IN A REGION WHERE YOU CAN ONLY MAKE A SUBSISTANCE LIVING AND YOU HAVE NO OTHERWISE MARKETABLE SKILLS, THAT IS SERFDOM, AND WE REMAIN ENSLAVED TO THE LAND.

NOW, THE RUSTIC WILDERNESS MAY BE A TOURIST ATTRACTION TO A WEALTHY ENVIORNMENTALIST, BUT FOR THOSE OF US WHO LIVE HERE, WE WOULD LIKE THE CHOICE OF GAINING SOME MATERIAL WEALTH, AND TO CHOOSE FOR OURSELVES THE BEST WAY OF LIFE.

NONE OF THIS IS TO EXPRESS CRITICISM OF THE SYSTEM. RATHER, IT IS SIMPLY TO POINT OUT THAT UNDER OUR SYSTEM, PEOPLE MUST HAVE THE INCOME TO HAVE A BETTER WAY OF LIFE; AND INCOME MEANS JOBS WITH WHICH TO EARN THAT INCOME. THE COOK INLET EXPERIENCE HAS SHOWN THAT OIL DEVELOPMENT NOT ONLY PROVIDES JOBS THROUGH DIRECT EMPLOYMENT, IT SPREADS REVENUE THROUGHOUT THE ENTIRE STATE. SINCE THE BEGINNING OF OUR CONSTRUCTION ENLIGHTENMENT, THE UNIONS REPRESENTING THE CONSTRUCTION TRADES HAVE OFFERED A FINE PROGRAM OF APPRENTICESHIP TO MANY OF THE ALASKAN NATIVES. ARE THESE PROGRAMS TO COME TO A HALT BECAUSE OF THE LACK OF EMPLOYMENT AFTER THE ALASKA PIPELINE? THIS TRAINING PROGRAM IS THE WAY OUT OF SUBSISTANCE LIVING FOR MANY OF OUR PEOPLE. THESE ARE THE MAJORITY WHO WANT AND DESERVE A BETTER WAY THAN OUR ANCESTORS.

NOT EVERY ALASKAN, WHETHER NATIVEBORN OR NOT, WANTS TO PACK WATER, EMPTY HONEY BUCKETS OR SEE THEIR CHILDREN BROUGHT UP IN A LIKE MANNER. THERE ARE PROGRAMS OPENING UP TO ALEVIATE THIS PROBLEM VIA THE INDEPENDENT REGIONAL CORPORATIONS, BUT AGAIN, WE CAN'T WAIT ANY LONGER.

THE STATES' REQUIREMENTS FOR REVENUE TO MEET THE NEEDS OF ITS CITIZENS ARE HERE AND NOW. IT'S SIMPLY NOT RATIONAL TO DELAY THIS OIL DEVELOPMENT AND FURTHER DELAY FOR WHO KNOWS HOW MANY YEARS, THE OPPORTUNITY OF A BETTER WAY OF LIFE FOR OUR PEOPLE, JUST SO SOME URBAN OFFICIALS AND OFFICIAL PLANNERS CAN HAVE MORE LEISURE TO PLAN WHAT FORM THAT IMPROVED LIFESTYLE SHOULD TAKE.

THE NEED IS NOW. THE OPPORTUNITY IS NOW. EVERY DAY OF DELAY WILL SIMPLY ALLOW MORE TIME FOR INFLATION TO ERODE THE OPPORTUNITY THAT WE CAN GRASP RIGHT NOW.

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TESTIMONY OF R. H. NANZ AT BLM HEARINGS ON
DRAFT EIS FOR GULF OF ALASKA

ANCHORAGE, AUGUST 12-13, 1975

My name is Robert H. Nanz. I am Vice President of the Western Exploration and Production Region of Shell Oil Company. I am here today because I am personally concerned about the issues involved. I am a professional geologist and I have spent just over half of my 28 years with Shell in Exploration and Production Research, both as a researcher and as a director of research. I refer here to my research background in order to establish my professional interest in exploration and production activities. I have served as Exploration Manager for onshore areas of the United States as well as for the West Coast offshore and Alaska. During the past 5 years I have been directly involved in 9 lease sales held for the Gulf of Mexico.

I appreciate the opportunity to participate in this hearing and present our views on energy and related problems. At the outset let me say we share with you and the people of Alaska a common concern for the need for energy. We share an equal concern for protecting the environment while securing that energy. Shell has frequently expressed its belief that energy production and environmental concern can be harmonious. In fact we have a Corporate Environmental Policy which expresses our commitment to conduct all of our operations in a sound environmental manner. This policy is attached for the record with the statement I am filing. Let me add that I believe our record over the past several years shows that we have attempted to live up to that policy and commitment.

You have heard testimony on environmental effects given by the Gulf of Alaska Operators Committee. To save time, I will not go further into this area other than to tell you that we at Shell, and I personally, agree with the information supplied. Further, I will personally commit that our Shell exploration and production activities in this critical OCS area under consideration will be carried out with our best efforts to protect and enhance the environment.

We as a Nation are in deep trouble. In fact, if we continue on our present course, we are headed toward a national tragedy. We are overly dependent on foreign crude oil and are becoming more so each day. Many people were aware of the problem, but the embargo of November 1973 left no doubt. Our economic position in the world has weakened. It didn't have to be this way. We would be in a much stronger position today if we had been permitted to continue to explore for and develop the Nation's oil and gas resources in the frontier areas of the offshore and Alaska. We have waited six years since 1969 for this promised sale in the Gulf of Alaska. Delays in the leasing of offshore areas, the 4-year delay in approval for construction of the Alaskan North Slope Pipeline and the ceiling on natural gas prices are primary causes of our present critical shortage of oil and gas. Expansions of exploratory and development activity as well as increased conservation measures are necessary to help solve this Nation's energy needs and economic problems.

Domestic oil production had been declining since 1970 and is now about 8.4 million barrels a day, a decline of half a million barrels a day from last year. According to the latest White House Fact Sheet, imports will increase to 7 million barrels a day by year end, about 40% of domestic consumption. In addition it is estimated that imports will average more than 7.5 million barrels a day in 1977 if no action is taken to reduce demand or increase domestic supply. Since the added imports are expected to come mainly from Middle East nations, our vulnerability to an embargo will be greatly increased.

Our company energy studies indicate that during the 1980's the required imports will be at a level of about 11 million barrels per day assuming 2.5 million acres of OCS lands will be leased each year and that economic incentives will exist. Now, if, instead of 2.5 million acres per year, we assume no frontier areas are made available, we estimate that the nation's need for imports by 1990 would be increased by an additional 4 million barrels per day. In terms of 1975 dollars and import costs, this would cost the Nation an additional 16 billion dollars per year. This would further weaken our economic security.

If we are ever going to regain command of our own destiny, we must move immediately and aggressively on both strategic and tactical plans. The strategic action should be aimed at our longer term energy problems and the development of greater supplies of power from coal, oil shale, tar sands, nuclear, geothermal, solar and hydro energy sources. None of these sources, however, except coal and nuclear, can provide a significant portion of the Nation's needs in the next ten years. Our tactical action should be to find and develop oil and gas resources as rapidly as possible consistent with sound environmental and economic practices.

One of the alternatives discussed in the draft environmental impact statement is to delay the proposed sale for one-half to two years to allow for completion of all baseline, onshore impact and other environmental studies in the northern Gulf of Alaska. The fact that these studies have not been completed is not a valid reason for delays in leasing.

The impact of exploratory drilling operations on the baseline studies in the coastal areas and the deeper waters would be minimal to none. There would be no pipelines and no tankers. Traffic would be limited to supply boats and helicopters probably at about the same level of activity as in baseline sampling operations. Onshore activity would consist almost entirely of the use of warehouses and storage yards for drilling supplies - pipe, cement, drill bits, etc.

The results of offshore exploratory drilling to determine if oil and gas actually exist and where they exist in the adjacent OCS are a necessary part of the data required for the proper development of coastal zone management studies. It is a waste of effort and money to plan for alternatives which may not occur. Obviously any concern is groundless if all the wells are dry. After exploration there will still be ample time - 3 to 5 years - before oil and gas production could possibly begin in which to complete all of the coastal zone studies.

Where are we going to find the new supplies of oil and gas that are needed to reduce our dependence on foreign oil? We estimate the future undiscovered potential for the U.S. to be in the range of 65 to 155 billion barrels of oil and 225 to 575 trillion cubic feet of gas. In terms of years of supply at 1975 rates of consumption, this is 11 to 26 years' supply for oil and 10 to 17 years' supply for gas. There is, of course, some chance that these estimates are low. For the good of the Nation, let's hope they are.

We have made an estimate of the amounts of future oil and gas that might be found offshore as compared to onshore. We expect about two-thirds of the new oil discoveries and about one-third of the new gas discoveries to come from the offshore.

The frontier OCS lands offer an excellent opportunity for additions to domestic energy production. While this Nation has been deliberating on the leasing and exploration of our offshore areas, other nations of the world have made intense efforts to develop their offshore resources. They are moving ahead to strengthen their economic positions. Exploration is underway in almost all of the offshore areas of the world.

For example, in the Far East almost all of the areas have been or are now under lease.

In the North Sea large volumes of oil and gas have been found and there are plans for further exploration and development.

In the MacKenzie Delta area in Canada, drilling is underway and many fields have been found. There is a great contrast between the almost completely leased situation in Canada - a country which is also sensitive to environmental protection - and the retarded situation on the U.S. side.

A survey of the situation in the world outside communist areas reveals that 34 percent of the continental shelves of the world is now under contract. In contrast less than 3% of the U.S. continental shelf area has been leased. Is it any wonder why we are becoming increasingly more dependent on imported oil?

We strongly believe that all of the frontier OCS areas must be put up for leasing and exploration in an orderly and expeditious manner. We have no assurance that the Gulf of Alaska or any other given area will be productive. Given our current state of knowledge, all we can say is that the potentials for oil and gas in each of the frontier areas are attractive, but naturally in varying degrees. The Gulf of Alaska is at or near the top of most lists.

However, estimates of the potential discoveries are quite imprecise for any new area. A good case in point is the government's and the petroleum industry's estimates of the hydrocarbons to be found in the Mississippi-Alabama-Florida Offshore Sale of December 1973. As expressed by the bonuses bid for the leases, 1.4 billion dollars worth of oil and gas was thought to have been purchased. To date and after the drilling of many wells no oil or gas has been found in the structures of that sale area and the initial exploration effort is almost over. On the other hand very few forecasters would have predicted the very large volumes of oil and gas found on the Arctic Slope of Alaska at Prudhoe Bay.

It is critical to the future of this country that all these frontier areas be opened to exploration promptly so that exploratory drilling can give us the answers to their future productive capability. Energy must not become an exercise in regionalism or an issue which pits state against state. Energy - its development, its production, and its consumption - is a national issue and should be a shared responsibility. We need to know as soon as possible which of these areas have productive capability so that the U.S. industry can gear up to provide the materials and trained manpower to undertake the development activities. More steel will be required from the mills to provide materials for the platforms, the drilling rigs, pipelines and ships. The development of the offshore should create thousands of jobs and put billions of dollars into the Nation's economy.

Industry has the capacity to evaluate and develop the frontier areas in terms of technical expertise, manpower and equipment. The capital requirements will be extremely large but the industry can meet them as it has always done in the past provided the economic environment is favorable.

As you are aware, the petroleum industry is still deeply "in the red" as far as the offshore is concerned. The government gets its share first and since 1954 they have collected in the form of bonus, rental and royalty payments about 95 percent of the total revenue generated so far in the OCS.

Industry's capital for new ventures must come from the revenues generated from the sale of its oil and gas production which includes "old oil" now under price control and interstate gas sales also under strict control. To enable industry to meet these capital requirements oil must be decontrolled with adequate provisions for reinvestment to expand energy supplies. As in the past, borrowing on the strength of future production from the proven reserves will also provide capital.

If the U.S. industries are clearly given a "green light" and a "clear track", they can and will gear up to build the equipment needed for accelerated exploration and production. The industrial potential for such an expansion is present in this country but a stable and hospitable economic climate must be developed to encourage the commitment of the large investments which will be required. Such a climate might also attract home some of the U.S. owned drilling rigs now operating overseas because of lack of domestic work.

The last topic which I wish to discuss briefly concerns policy for exploration and development of the OCS and the method of awarding offshore leases. We strongly believe the present leasing system is the optimum one for the good of this Nation and should be continued without changes for the following five reasons.

Firstly, more oil and gas will be found under the present system whereby the search is conducted simultaneously by many groups using different exploration strategies. No single decision making body, a single company or a government will find a large proportion of the oil. The greatest amount of oil and gas is found by the diverse and parallel efforts of numerous companies each applying its own geologic strategy to the earth's crust. This is recognized by both industry and government professionals. For example, three or four groups tested their strategies on the North Slope before one group finally succeeded. I am

nagged by the thought that Prudhoe Bay type fields might not be found if the concept and decision making of a single group, such as a government agency or one company were substituted for the multi-pronged approach of the current competitive system.

Secondly, the present system provides for an immediate and substantial revenue to the government in the form of bonuses and rentals plus royalty payments and taxes during the life of the production. Concern has been expressed that the public has not received a fair value for their leases. We recently conducted an analysis of the distribution of revenue which will result from the production of oil and gas discovered on OCS leases in the Gulf of Mexico during the period 1964-1973. In this analysis actual prices were used for past production; for future production we assumed that the current price structure would continue. We further assumed there would be no increase in developing and operating costs and no changes in tax laws.

During this period we estimate that the petroleum industry spent about $10.8 billion on exploration alone and discovered 4 billion barrels of oil and 24 trillion cubic feet of gas. In addition the industry spent, or will spend, $9.5 billion for development and operating costs in producing these volumes. Costs of salaries, materials, equipment and services related to exploration and development and daily producing operations which are paid to various sectors of the economy other than the government, take about one-third of the gross revenue. Of the remaining two-thirds, we calculate that the government will have received about three-fourths in the form of lease bonuses, rentals, royalties and taxes, leaving the industry about one-fourth. The government therefore will have received almost three times as much as all the companies in the entire oil industry. Taxpayers put up no money and took no risks. In addition the government received much of its share immediately after each sale as bonus, whereas industry must wait years to begin recovering its investment. The industry profit after tax, therefore, based on discounted cash flow analysis is only about 5 percent.

These data prove that the existing system generates intense competition. I can tell you that from personal experience I know of nothing more competitive than an offshore lease sale. Let me cite some other evidence of this. The high bids in the 15 OCS lease sales since 1967, which totaled $13.6 billion, exceeded the second high bids by $6.3 billion. In other words, 46 percent of the high bids were "left on the table" - were unnecessary to get the lease. The government gets this extra money that is an outgrowth of competition among scores of companies. In addition it does not constitute a barrier to participation by smaller companies as some critics allege. We have been partners with small companies in many sales. Our data show that for the 15 OCS sales since 1967, companies other than the 8 largest domestic producers have shared in two-thirds of the leases and obtained 51 percent of the working interest.

Thirdly, the present method attracts technically and financially capable and responsible operators who intend to follow through with sustained and complete operations. It also maximizes prompt and efficient evaluation and development of leases. Some proposals, such as royalty bidding, do not require any appreciable pre-discovery expense and economic risk and hence encourage speculation. Other proposals, such as profit sharing, do not encourage promptness due to lack of

front-end investment to be recovered nor do they encourage efficiency since the government is paying part of the costs.

Fourthly, the existing procedures place the sole risk of OCS entry and development on the operator. The U.S. taxpayers are not being asked to risk their monies on wildcat drilling. At a time when the budget deficits are at all time highs, it does not appear logical for the government to assume the additional obligation to spend the billions of dollars required for evaluation and development of the offshore.

Fifthly, the present system encourages development of new technology in offshore exploration and development. The dominant source of new technology in the world in the field of petroleum exploration and production has been the United States. The research laboratories of U.S. oil companies and petroleum related contractors have produced the major portion of technical developments. Evidence that American technology dominates the world petroleum scene lies in the fact that about 80 percent of the seismic crews and mobile drilling rigs operating around the world in offshore waters are American. The world recognizes the U.S. as the leader in petroleum technology. Why is this so? I believe the only answer is that the competitive system we have in this country stimulates new technology.

In conclusion, I would like to re-emphasize the seriousness of the energy problems facing this Nation today. The current critical shortages result primarily from delays in the leasing of offshore areas, the 4-year delay in approval for construction of the Alaskan pipeline as well as the artificial ceiling on the price of natural gas. The frontier OCS lands offer an excellent opportunity for desperately needed additions to domestic energy production. Industry must be allowed to get on with the exploration of all of these frontier areas in an orderly and expeditious manner. We believe the industry can and will do the task in an environmentally acceptable manner. And, finally, we believe the present leasing system has worked well in the past and should remain unchanged.

If time permits and there are any questions, I will be pleased to answer them.

Thank you, gentlemen.

The Mapmakers

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Presentation by Brigitte Lively to
Hearing on Gulf of Alaska Offshore Leasing

Ladies and Gentlemen:

Thank you for the opportunity of presenting my reasons why I favor the northern Gulf of Alaska Offshore lease program as scheduled.

I am Brigitte Lively. We live in the Matanuska Valley, about 40 miles from Anchorage, where I also head the operations of The Mapmakers. I have been in Alaska continuously since 1960.

I have no engineering or biological experience, and therefore should not dwell on subject of safety in construction, safety to personnel, safety to the phytoplankton, vegetation, zooplankton, benthic invertebrates, marine fish marine and coastal birds, marine and coastal mammals, and the chemical substances in the ocean's water. I am confident that the engineers and scientists that have developed the offshore drilling facilities that are in use now, are continuing to apply their newly gained knowledge from each fresh condition encountered during offshore drilling in other parts of the world and off America's coast, and are doing their best to uphold a good record. After all, only 4 significant spills out of a total drilled 18,000 offshore wells in the past 25 years is acceptable by any standards of human undertaking.

What I would like to dwell on a little more is a word that has been connected with offshc drilling lately: Logic.

If there is a great demand for a commodity, one tries his best to supply that demand. If one could put a moratorium on hunger, then it might be logical to put a moratorium on finding the resource that satisfies hunger. As you all know, energy derived from oil anc gas is just one of the applications of that resource. Fertilizer is another one. It is not quite logical to develop a strain of wheat that would yield record harvests for under-developed countries, if this strain of wheat is only living up to its potential based on an abundant supply of petrochemical fertilizer. It is not quite logical for American farmers to have to pay 2½times more for fertilizer within one year because of high import oil prices, when the prices could be held down by using our domestic supplies. A shortage of oil and gas affects our food needs, and the worlds/ just as much as our energy needs. While some of our doom sayers warn us of impending world starvation, they store up on freeze dried food and soybeans for their own needs, and at the same time stifle those whose job it is to supply energy and food to all. That is not good logic. There are other examples of errant logic, and I hope that this honorable committee and others put the testimony of those in proper perspective, who would like to delay the efforts of the oil companies in finding oil; and yet invest their monies in stock certificates of these same companies whom they are fighting. Is it logical for the leaders of a community, who is ensured some 20,000 acres under the Alaska Native Claims Settlement Act(without fear of encroachment) to talk of "cultural genocide", when the sophisticatior which is expressed with such a statement would lead one to believe that with that much knowledge the implied danger could be thwarted, or the upcoming events be turned to the advantage and enhancement of cultural preservation.

This popular logic brings me to another widely used term connected with the circumstances

f this hearing: Socio-economic impact, which is used in a way to illogically imply: socio-economic disaster. This expected adverse impact on our coastal gulf communities, as well as the often mentioned assault on Alaska itself, and the effect that these exploitive maneuvres have on the land of our children and grandchildren, reminded me of the various books I had read on early Alaska. Can you imagine an "unplanned" impact on communities like Nome with a sudden population increase of 12,000 people, 35,000 going through Skagway, 30,000 though Dawson, Yukon Territory? Have you been to these former boom towns, lately, or others such as Knik Sunny Knik, Ruby, Chitina, Iditarod, Matanuska? Were you able to find some of them at all? Would you not imagine that, first of all, the people in those days in the obvious boom towns did expect a moving on of the populace and a stabilization of things after the height of activity would be over, and planned while the boom was going on, and "made do" with the inconveniences they accepted because they decided to stay with it. Charles R. Tuttle in "The Golden North", a book which he wrote in 1897 shows great insight in describing the impact this gold rush had on one town, and how he and others realized that this boom had to be followed by a let-down, and that was prepared for as the opportunity presented itself; but that this relative unpreparedness, which is in no way comparable to our sitation due to the improvement in transportation, technology, instant housing and communication, as well as our awareness expressed in impact statements, and other studies on the situation in question already, also brought out the greatest virtues in men. Virtues that were totally absent even back in the good old days of '98, in the socalled civilized parts of the United States. Think of how those men of '98 in Alaska's coastal towns, the Interior or the Yukon Territory would have enjoyed the conveniences of a planned socio-economic impact! Or would they? Might they not have profited from a moratorium on gold exploration, so their arrival could have been planned for, their stay been made comfortable, and their departure well regulated, so as not to leave any adverse impact? Whatever the answer, for us these bygone days are a part of our history and heritage, of stories and tales of lives of a people that were unique to us because of the boom and bust aspect. I am sure that most of the people of that era were aware of their special circumstances in their special situation - and they drew the consequences once they chose to be part of it - be it boom or bust. As for the towns themselves - they are romantic reminders - if there is anything left at all - ecological balance restored - historic places which we visit in memory of Alaska's colorful past. Some we even restored in order to remind us of their significant past. I think most uf us are aware of the fact that Alaska and her coast is useful to us for her

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Statement of

W. L. Cole
Vice President Gas Supply
Southern California Gas Company

Presented Before The

Department of the Interior
Bureau of Land Management
Hearings on Proposed Leasing in the Northern Gulf of Alaska

Anchorage

August - 1975

Statement of W. L. Cole
Vice President Gas Supply
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Hearings on Proposed Leasing in the Northern Gulf of Alaska
Anchorage - August - 1975

I am William L. Cole, Vice President of Gas Supply for Southern California Gas Company and am appearing on behalf of that company and Pacific Alaska LNG Company. I am appearing here today to present information regarding the proposed leasing of Outer Continental Shelf lands in the northern Gulf of Alaska and the importance of such leasing to southern California.

The Southern California Gas Company is a public utility subsidiary of the Pacific Lighting Corporation and has been distributing natural gas to southern California homes, businesses and industry for more than one-hundred years. The Company's service territory includes, generally, the southern half of the State of California. Overall, Southern California Gas Company is the supplier of gas to an area having a population of approximately twelve million. In 1974 Southern Cal's sales and own use of natural gas were in excess of 906 billion cubic feet; it received an average of 2-1/2 billion cubic feet per day from its suppliers. Service to a total of 3.3 million residential, commercial and industrial customer meters makes Southern California Gas Company the single largest gas distribution utility in the United States.

My appearance here today is prompted by the need to stress the importance of the nation's Outer Continental Shelf resources to the natural gas industry and to direct your attention to consideration of natural gas supply problems.

Unfortunately, it has seemed to us that in discussing the advantages and disadvantages of Outer Continental Shelf development, the focus has been exclusively on oil. We feel that there is also a need to focus on the significance of the potential for natural gas resources in the Outer Continental Shelf.

As a nation, natural gas has in recent years supplied approximately 30 percent of our total energy demands. Natural gas customers vary in size from the smallest domestic residential consumer--even apartment house occupant--to large petrochemical facilities based upon use of natural gas as a raw material. In recent years, as the supplies of natural gas have failed to keep up with demand for this premium fuel, curtailment of deliveries to many industries has been necessary. So far this has generally been limited to large volume consumers such as electric generating plants, but in some parts of the country the limited supplies of natural gas have prompted local regulatory groups to temporarily suspend the connection of new gas consumers to the systems of local distributors. In many cases, including our own, the limited supply of natural gas has required curtailment of deliveries to an increasing number of industrial customers, particularly in the colder periods of the year when residential demands are highest. In most instances, industrial customers are required to maintain a capability of utilizing alternate fuels when supplies of natural gas are to be curtailed. Unfortunately, however, many small industries do not have this alternative fuel capability and must rely upon continuing supplies of natural gas in order to remain in operation.

Southern California has long depended upon natural gas as its primary residential, commercial, and industrial energy source. Today gas satisfies 55

percent of this area's total non-transportation energy needs. During 1974 the amount of energy delivered by Southern California Gas Company was 2-1/2 times the energy generated by all the nation's nuclear power plants. Nearly all of the residences in southern California use gas for household heating (92%) and water heating (94%). About 77 percent use gas for cooking. In addition, Southern California Gas Company has nearly 180,000 firm service commercial customers such as schools, hospitals, churches, restaurants, hotels, laundromats, small offices and similar smaller operations. There is no practical alternate fuel available to these customers. Also receiving firm natural gas service are nearly 7,000 customers specifically identified as industrial. Many of these have an essential processs requiring a gaseous fuel. Others have no alternate energy sources because their volumes of energy use are too small for the alternatives to be economically feasible or their facilities are not amenable to installation of the equipment or fuel storage required. A significant portion of this firm industrial service is used for space heating for human needs in industry.

Our regular interruptible class of customers is made up principally of 1,165 large commercial and industrial customers but includes a few residential-type customers. The other interruptible customer class consists of the large utility electric generation customers. Natural gas service to these customers has always been provided on an interruptible basis. As recently as the late 1960's, Southern California Gas Company had served as much as 80 or 85% of the annual fossil fuel requirements of these utility electric generation customers. However, with the decline in available gas supplies which Southern California Gas Company has experienced during recent years, the level of gas service to these customers has declined steadily. It is currently estimated that in 1976, next year, deliveries to these customers will be virtually non-

existent.

That brings me to a discussion of the natural gas supply situation for southern California. Since 1969, we have not been able to contract for any additional increments of gas supplies from our two present out-of-state suppliers - El Paso Natural Gas Company and Transwestern Pipeline Company. On the contrary, under decisions issued by the Federal Power Commission, we have been subjected to major curtailment of supplies by these companies--curtailments which are expected to grow larger in the months and years ahead. In addition, since 1968 the quantity of gas we have been able to obtain from local California sources has declined by about 80%. This situation is not unique. There has recently been considerable publicity given to the deterioration of the natural gas supply situation on a national level. There have been reports indicating that prospects for further curtailments in supply should be expected for the forthcoming winter and that these are expected to lead to increases in the level of unemployment in certain parts of the country. The situation is very serious.

I have attached a chart which illustrates the natural gas supply and demand situation in southern California assuming we do not get any additional gas supplies. By examining this chart you will note the anticipated continuing moderate growth in requirements expected for our service area and you will also note the significant drop in actual and forecast gas supply available to meet those requirements. As I mentioned, this forecast trend in supplies is based upon sources currently available to our system and does not include the possibility of receiving additional supplies which I will discuss shortly. The chart indicates that, under average-year weather conditions of the fore-

cast trend, not only will service to utility electric-generating plants from our system in 1976 be virtually non-existent, but our other interruptible customers will receive severely diminished supplies. You will also note that in 1979 supplies available are estimated to be inadequate to meet full requirements of the firm customers in southern California. This is a dangerous prospect for our community.

One solution that may seem plausible, that is, conversion to electricity is not an answer. A simple calculation can be used to demonstrate this. If no new gas supplies are obtained, the Gas Company would be curtailing 15 percent of its firm or non-interruptible load by the year 1980. To replace this gap in natural gas energy with electricity, it would be necessary to build an electric system having a capacity equal to the entire Los Angeles Department of Water and Power, the nation's largest municipal electric utility. A similar increase in electric capacity would have to be built in 1981. Obviously this is not feasible nor possible. The electric utilities already have their hands full keeping up with their own growth and demand of existing markets.

The substitution of fuel oil or coal in homes and for other small users is equally impractical considering environmental problems and the lack of a distribution system. Of course, this brings out another important consideration recognized in southern California for almost 20 years--that natural gas should be used by industry to the extent possible for environmental reasons.

I mentioned earlier the dangerous prospect of the curtailment of our firm customers. The increasing curtailment of our interruptible industrial customers also has serious adverse economic and other consequences. Those companies,

that for whatever reason cannot turn to alternative forms of energy, are faced with shut down. Whether the shut down be temporary or permanent, the resulting unemployment and economic dislocation, both direct and indirect, presents a frightening picture. Every effort has to be made to get adequate gas supplies to avoid--or at the very least--minimize the curtailment of these customers.

That brings me to the subject of exploration and development of the Federal Outer Continental Shelf areas. Southern California Gas Company is strongly in favor of proceeding with leasing, exploration and development of potentially productive Outer Continental Shelf lands around the United States. Because of the many months and years that will be required to bring any resources in these areas to a point where they can be used to meet local requirements, it is vitally important that the Federal Government expedite this activity as rapidly as possible. We are very concerned about the long lead times that are required from leasing until substantial volumes of gas - and oil - can be delivered. We feel that it is essential to proceed with the necessary steps to develop these lands now.

We have, for a number of years, actively supported the development of our nation's offshore oil and gas resources. At every opportunity, we have taken a position in favor of development of the OCS areas, including those in the Santa Barbara Channel, the Southern California Outer Banks area, the Cook Inlet Basin, and in the Gulf of Alaska. In late 1973, a detailed statement favoring leasing and development of the natural gas resources in the Gulf of Alaska was submitted to the President's Council on Environmental Quality for its consideration. In our planning we recognize that a liquefied natural gas

project will be required to beneficially utilize the natural gas resources developed during the course of exploration in this province. Preliminary studies of such a project have been completed and more detailed analyses are underway. The management of the Pacific Lighting companies has indicated its intention to be actively involved in the marketing of natural gas from this area.

Let me assure you that we understand the environmental concern relating to offshore drilling. We recognize the need for appropriate safeguards, such that the developments we are talking about can be accomplished in an environmentally safe manner. We believe that this can be done. We would not support any proposal which in our view bore an unacceptable risk to the environment. But give industry and man's ingenuity a chance to meet this challenge. Problems have been solved before - and they can be met in the OCS environment.

I don't want to leave you with the impression that we are going to be relying exclusively on OCS development for additional gas supply. We are not. To help develop additional domestic supplies, we are participating in gas exploation in our traditional supply areas of the Southwestern States - New Mexico, Oklahoma and Texas. An affiliated company is participating in a proposed coal gasification facility to be constructed in northwest New Mexico. We are also involved in projects relating to bringing gas from the Arctic areas of Alaska and Canada and in the form of LNG from Indonesia and southern Alaska. But these projects do not reduce the importance of expeditious development of the OCS. The anticipated decline in deliveries of gas to ourselves and other gas companies from our respective traditional sources in the lower 48 point up the need for increasing gas supplies from all sources just as rapidly as

possible.

One other matter. I have been talking about supply. Our management also recognizes the need for conservation of energy. Maximum conservation steps are absolutely essential. However, it is our view that these efforts will simply not be sufficient to eliminate the necessity of developing additional supplies to substitute for the depletion of our existing sources and to meet the growth in energy demand which will exist even with maximum conservation efforts.

SoCal Gas's support for conservation manifests itself in such efforts as our CONCERN program, which gives recognition to builders using energy-saving construction techniques, our residential insulation sales program and our public information program suggesting means of conserving energy to our customers. Our customers have heeded the call to conserve energy. At the present time, consumption by our firm customers, mostly residential, is about five percent below what we would have estimated absent conservation.

Our success, along with that of others, in achieving a solid reduction in energy use through conservation should not be misinterpreted. It does not follow that we will be able to continue reducing energy demand at the previously experienced rate. Much remains to be done in the area of conservation, but we must recognize that the reduction which has occurred is the easily accessible "fat" in our energy load. Additional savings will be much harder to produce.

Now, I would like to make some specific remarks on the Draft Environmental Impact Statement for the proposed Northern Gulf of Alaska lease sale:

#1 On page 4, the authors have indicated possible recovery factors for oil. It is suggested that the authors may also consider indicating appropriate recovery factors for associated-dissolved gas or non-associated gas, or if they do not wish to indicate such recovery factors, perhaps they could indicate the reason for not doing so.

#2 On page 9, the authors have indicated that one LNG plant is expected to be completed in the Gulf area during the year 1983. We can offer no alternative suggestion for this assumed timing, but would point out that any LNG facility must be justified upon the delineation of sufficient natural gas supply to support the economic feasibility of the required investment. In addition, it should be recognized that such a facility should be considered as early as possible during the development history of a province such as the Gulf of Alaska in order to minimize any wastage of natural gas which might occur because of the production of oil during a period prior to the time an appropriate gas market can be developed. In view of these considerations, the timing suggested by the authors for the construction of the LNG plant, by the third year of the development well drilling program, may be appropriate.

#3 In Table 2, on page 13, and at several other places throughout the DES (including, among others, pages 347, 513 and 529), it is indicated that the proposed LNG plant may require approximately 120 acres. We believe that to be near the absolute minimum of space required for such a facility. It is quite possible that the area

required for such a plant may exceed 200 acres, particularly if significant gas reserves (even exceeding those assumed in preparation of the DES) are eventually developed in the Gulf of Alaska.

#4 On page 526, the statement is made that "A producing gas well normally has safety flares ignited." We believe this to be incorrect. Such safety flares have been operated for a number of years on platforms in the Cook Inlet area where oil and associated gas are produced. However, we do not believe that it is a normal requirement to have safety flares in continuous operation where gas is the only produced fluid.

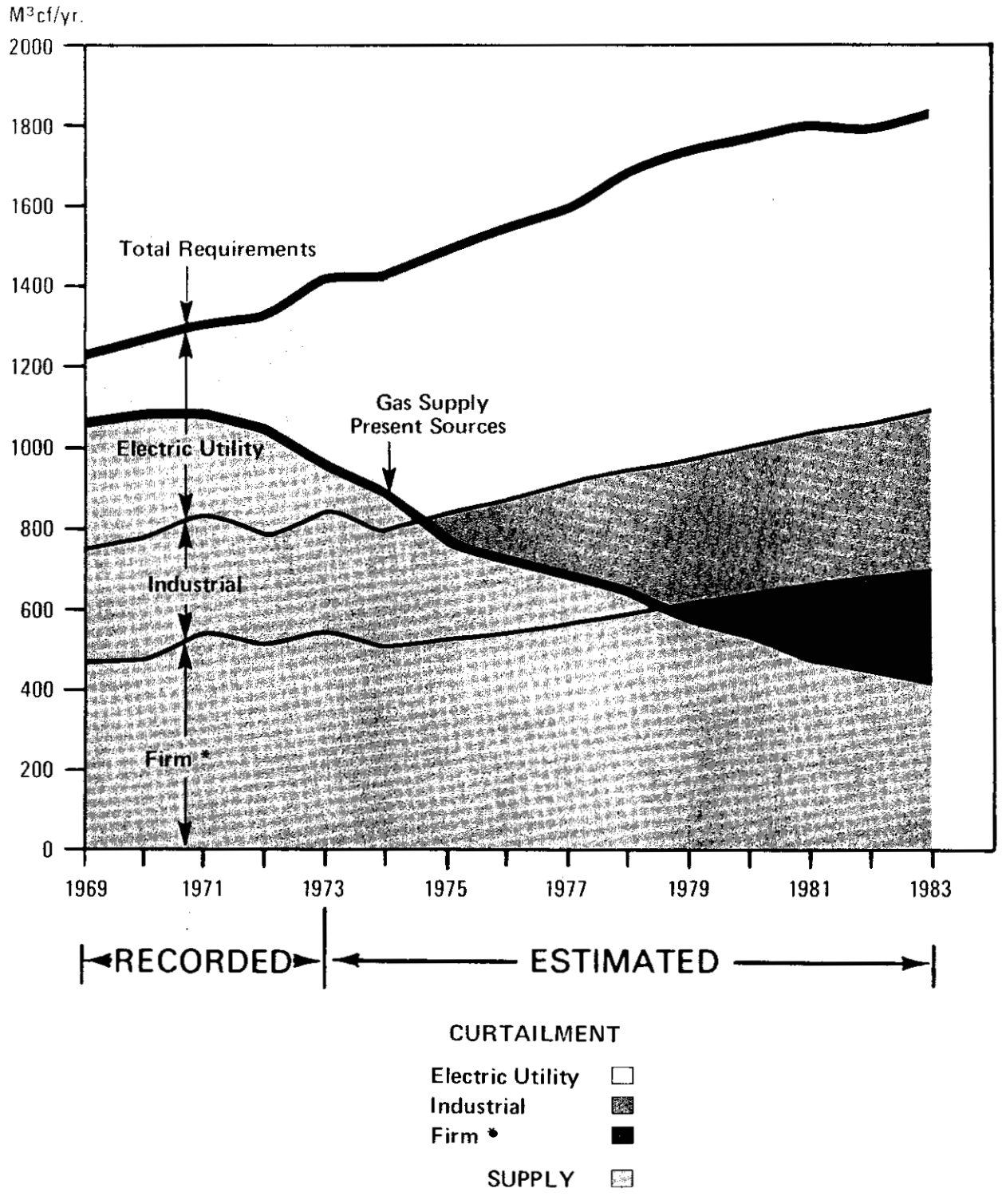
#5 In Appendix 2, on page 2-19, it is indicated in the paragraph designated "A. General" (under the subject heading "5. Oil Well testing procedures.") that "Measured gas volumes shall be adjusted to the standard conditions of 15.025 psia and 60° F. for all tests." We recommend that the Bureau of Land Management, the USGS, and the Department of the Interior, or any other agency concerned, revise such a statement to require the reporting of measured gas volumes on a standard pressure base of 14.73 psia. We feel that this is especially critical in any Federal offshore area where produced gas is likely to be transported, sold or otherwise disposed of under the jurisdiction of the Federal Power Commission. The FPC has standardized all of its reporting and publishing requirements on a standard pressure base of 14.73 psia. If the Department of the Interior could adopt the same standard, particularly for new,

frontier areas such as the Gulf of Alaska, it would simplify the reporting requirements of those companies and agencies subject to government jurisdiction, and would also reduce certain areas of confusion which inevitably arise because of variations in such reporting and publishing standards.

In conclusion, let me stress that in your considerations of the problems related to the development of Outer Continental Shelf lands, do not overlook the potential natural gas resources estimated to be available in those areas and the vital need for such natural gas resources to meet the energy demands in southern California and in the nation as a whole.

Thank you for the opportunity of allowing me to make these remarks to you today.

Pacific Lighting Utilities
GAS SUPPLY-REQUIREMENTS COMPARISON
PRESENT GAS SUPPLY SOURCES



* Residential and other small industrial and commercial consumers not equipped to use alternate fuel

SOURCE: 1974 California Gas Report

(36)

CALDERWOOD AND MANGUS, INC.

CONSULTING GEOLOGISTS

425 G STREET, SUITE 980
ANCHORAGE, ALASKA 99501

907-279-6551

My partner, Keith Calderwood, who is unable to attend this hearing, asked that I make a brief statement for the record. Mr. Calderwood commenced mapping the geology of the Yakataga District in 1953 and has worked in the area intermittantly since that time. He has authored a very comprehensive report of the geology of the Katalla-Yakutat area in the Gulf of Alaska sedimentary province which has been sold to several companies who plan to explore for petroleum in this area. He has personally visited more than 50 oil and gas seeps along the coast some of which are comparatively large (up to 1/2 barrel per day). Some of these seeps have been known since 1898 and were the cause of the early drilling in the old Katalla oil field which was the first commercial oil field in Alaska.

It is our opinion that the seeps and oil development of the past have not adversely affected the environment and that development of the anticipated offshore reserves can be done safely and without seriously affecting the onshore and marine environments of the Gulf of Alaska.

(37) STATEMENT GIVEN 8-13-75 AT BLM HEARINGS ON THE DRAFT EIS IN THE GULF OF ALASKA

My name is Chuck Evans and my testimony presented today is as an individual, however, I feel that I should qualify myself to speak. Therefore, I will give you a sketch of my background.

I spent fifteen years in the exploration and production department of a major oil company working in all of the important domestic petroleum provinces. I have been an Alaskan for nine years. I am presently the head of the Petroleum Department of The First National Bank of Anchorage. I hold degrees in business, geology and law. I am the former chairman of the Planning & Zoning Commission of the Greater Anchorage Area Borough and am presently an Assemblyman of the Greater Anchorage Area Borough Assembly. I have also lectured in the field of oil and gas economics throughout Alaska.

It has been said that if all economists were laid end to end they couldn't reach a conclusion. In variation it has been suggested that if these same economists were laid end to end, it might be a damn good thing. In spite of these comments, I would like to present testimony in the area of socio-economics.

Prior to entering that area, however, I feel very strongly that the technology to explore - and hopefully with discovery to develop - the OCS, Gulf of Alaska is available and has been for some time. History alone will tell you that the oil industry does not first explore in this era of enviornmental enlightment unless their exploration is technologically perfected. Obvious examples are the Cook Inlet development and the North Slope exploration.

The oil industry has been in Alaska for many years but not until 1957 with discovery of Swanson Field on the Kenai Peninsula was the decision made by the State of Alaska to hang its economic star on the oil and gas industry. It was a good decision.

The oil industry is giving to Alaska the only solid long term economy that we have ever had. Don't become so enamored with unreasonable environmental restrictions that you forget the socio-economic needs of the Alaskan people.

We are presently building a pipeline from the North Slope to Valdez and although I do not believe that we will suffer a great economic recession after its completion, I do feel that to insure strong economic growth, we must have development in other areas which have the potential of producing hydrocarbons. The Federal Government is ready, the oil industry is ready and the people of Alaska's need's are crying out for OCS sale in the Gulf of Alaska to solidify and expand our economic base. The OCS sale will provide jobs for people not only in Yakutat, Cordova and Kenai, but also in the Anchorage area. The money placed in our economy from jobs is the best money for our community for it doesn't filter through the hands of politicians as in the case of royalty or tax revenues. Jobs for people are the true measure of success in a community.

If there is a problem with impact, it's not impact caused by the oil industry but rather impact caused by non-responsive government that has cautioned on growth but reluctant to prepare for it.

I have in my capacity as an assemblyman and planning commissioner stated that we must prepare for that growth that will come from development of our some fifteen sedimentary basins in Alaska. My warning has not been particularly pointed toward the oil man coming into the state because they come with a job. They are an unique breed that participate in community affairs. A survey done some years ago pointed out that some 80% of them owned their own houses, an excess of 80% voted in elections and it is apparent in the Anchorage area at least that their families participate in community affairs. They don't live off the community but contribute to it.

A real impact comes from those fire flies attracted to the light of success and this is the impact we must prepare for. Those people that come to Alaska and claim life style protection, but in reality are the unemployed and the unemployable. They are here today and were here yesterday - ask them if they participate in a positive manner in our communities or is their's a negative life style.

I would like to conclude by saying that the reason the state doesn't want the OCS sale is that they need the revenue that will be produced from either development on state lands or on federal uplands and in their myopic vision they do not want the direct benefit of a solid economy that guided growth will bring. Had the state planned its spending as well as the oil industry has planned its exploration and development, the state would not be in the financial straits that they are in today.

I do believe, however, that coastal states should share in the revenues from OCS development - at least in a greater percent than non-coastal states and that federal impact funds should go as directly as possible to those communities impacted.

I see by the increased deposits in my bank that the people have money and the living is good, but let us solidify this growth by spreading our exploration and development base in other areas that are highly potential for the discovery of hydrocarbons and provide the opportunity for employment to all Alaskans and thereby freedom of economic independence.

Do not delay the outer continental shelf lease sale in the Gulf of Alaska.

Thank you,

CHUCK EVANS

SKILL
RESPONSIBILITY
INTEGRITY

THE ALASKA CHAPTER
ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.
BOX 4-2500 • ANCHORAGE, ALASKA 99509
TELEPHONE (907) 272-3417

3201 SPENARD ROAD
ANCHORAGE
GEORGE ED. SMITH
MANAGER

August 13, 1975

Secretary,
U.S. Department of Interior

Thank you, Mr. Chairman. My name is Steve Stephens and I represent the Alaska Chapter of the Associated General Contractors. I am here to speak in support of the proposed OCS lease program in the Gulf of Alaska.

We endorse this proposal because there is no question but that the United States needs additional sources of domestic oil and there is good reason to believe that some of it can come from the Gulf of Alaska.

In fact, I haven't heard anyone say lately that the Gulf of Alaska shouldn't be explored and developed. Some people are saying that the program should be put off a few months, or a few years, for various reasons. One says we need more research. Another says wait until the State gets a coastal zone management law to better regulate the activity. A third says hold off until the State is guaranteed a share of the revenue by act of Congress.

There can never be enough research to satisfy some people. The industry says it is technologically ready for safe operations in the Gulf and a number of government agencies will be standing by to make them prove it. That should be sufficient insurance.

I don't intend to argue whether or not the State needs a coastal zone management law. But our members who have worked jobs in the coastal areas would probably argue that the State agencies seem to have plenty of management authority already.

Probably everyone in Alaska would like to see OCS leasing held off until Alaska can be assured a share of the revenue. God knows, we need the money. But it is unrealistic to try and block something so much in the national interest while parliamentary maneuvering goes on, possibly for years, in Congress over who is going to get how much of what.

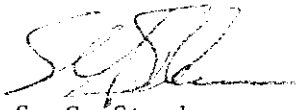
There is another serious aspect to delaying the activity. That is the inflation factor. We all saw what happened to the trans-Alaska oil line cost as a result of prolonged delay. Any contractor can tell you horror stories about what has happened to operating costs on his construction projects in the past two or three years.

Every year work is delayed, the higher operating costs will climb and the more economically marginal any oil discoveries will become. That is not in the best interest of the nation or Alaska.

Thank you, Mr. Chairman.

Sincerely,

ALASKA CHAPTER
ASSOCIATED GENERAL CONTRACTORS



S. C. Stephens
President

SCS/dlc

Cordova District Fisheries Union

Headquarters: Box 939, Cordova, Alaska

Seattle Office: 84 Union Street

August 22, 1975

Connie Wassink
Bureau of Land Management
800 A Street
Anchorage, Alaska

Dear Sir:

Enclosed are copies of the Cordova District Fisheries Union EIS testimony and copies of Cordova City Council and Chamber of Commerce resolutions.

During a Cordova District Fisheries Union general membership meeting held August 18, the membership voted to support the State of Alaska in case of litigation over the OCS lease sales.

We hope this will be a benefit to you and would appreciate any and all information you might be able to send to us in regards to our position.

Sincerely,

Bob Blake
President

enc.
bb/mh

Cordova District Fisheries Union

Comments on EIS , OCS , Proposed Oil and Gas Leasing in

The Northern Gulf of Alaska

August 13, 1975

Mr. Chairman-- Members of the Committee;

My name is Robert Blake, Iam Chairman of the Cordova District Fisheries Union, and President of the Cordova Aquatic Marketing Assn.

F
I am here to represent as best I can, some of the views of our 400 fishermen members on the Draft Environmental Impact Statement, Outer Continental Shelf, Proposed Oil and Gas Leasing in the Northern Gulf of Alaska.

One of the areas of gross neglect in the EIS is the failure to mention the some 1100 people directly involved in the various fisheries in and around the Prince William Sound, Copper River and Bering River area, nor the 200 plus cannery workers that make their living processing their catches.

Certainly this amount of people who depend upon the North Gulfs virtually pollution free environment for their livlihood and lifestyle should be worthy of at least a casual mention. However apparently the Department of the Interior in keeping pace with the rest of the EISinformation feels that small oversights such as the human resource that will probably be displaced by the developement of OCS Oil is of little consequence.

We, the fishermen of the Cordova, Prince William Sound area dearly wish we could ignore the Dept. of the Interior and its actions as easily as they appear to ignore us. Sadly however this is not the case. We are approching a era of decision, in which the U.S. Dept. of the Interior will condemn or condone our very existance.

We have conservativly estimated the equipment used in catching and processing fisheries products in our area at $55 million. During the typical life of a oil field (25 yrs) we have again conservativly computed the value of the Cordova area fisheries on the principle species such as salmon, herring and shellfish only, as $400 million ex vessel value to the fishermen or $800 million at the first wholesale value of products. The total fisheries value both domestic and foreign for all species are in the 1 to 2 billion dollar area.

These figures put the dollar value of the fisheries products to be extracted from the watersof the Copper River , Prince William Sound area on a par with the production value of one of the oil fields expected to be developed from this sale. The great difference being, that the fisheries, if left unharmed by mans pollution can eventually produce and exceed the dollar value of the whole proposed lease sales oil production. What probably should really be considered more heavily than the dollar value is the ability of the area to produce food to feed the hungry world for as long as mankind exists, should mankind allow it to do so.

Certain sections of the Draft EIS tend to downgrade the dollar value of the fisheries of our area, for example on page 506 " The commercial value of salmon caught in the Copper River District averaged $1,157,632 between 1960 and 1969 " While statements such as quoted cannot be classified as truly erroneous, they do not show the true valueof the fishery. This example given can only be considered the ex-vessel price paid to the fishermen for the Cpopper River gillnet fishery and did not include the Prince William Sound seine and gillnet fishery which usually is of considerable more valuedue to the larger number of fish caught. It also deletes the millipns of lbs. of shellfish products taken during the same period and uses of course a period when fisheries products were of considerable less value than they are now. To accurately

...ow a comparrison the EIS should at least treat the Fishing Industry as equally as it does the Oil Industry.

On pages 577 and 578 - an example of a hypothetical oil spill--superimposed on the Copper and Bering River area and P.W.S., according to the EIS results in a 804,345 lb. reduction in fish catch. This is based on a presumption that no fish are taken for 60 days and that half the median number are taken the next 60 days. Some $259,625 in fishing revenues would be lost, assuming that the catch in the affected area is salmon, finfish and shellfish. Based on a relative importance of 1973 poundage landedetc. etc..

Another grossly false illusion created-- In the first palce for example, conservativly there was over 36,500,000 lbs. of the above mentioned species of fishes landed in the area in 1973. With simple arithmetic this amounts to at least 100,000 lbs per every day of the year. Using the EIS figures for ex-vessel price, the same 60 day period of whole loss and another 60 day period of half loss would amount to a value of $2,800,000. Should the spill occur during our peak salmon run period it could easily reach a 7 or 8 million dollar loss.

Probably the most unrealistic statement made in the EiS concerning the dollar value of the fisheries is on pages 573 and 574. quote " A summary of the factors influencing economic growth in Alaska during the period of 1961 to 1972 concluded that during this period the fisheries industry including both commercial fishing and fish processing, increased only slightly etc. etc.. On balance, Alaskas renewable resources industries have made no net contribution to the real growth of the economy ." end quote

I cannot for the life of me understand how such statements were allowed t be printed in a document of this magnitude. The increased dollar value of salmon has primarily compensated for the decrease in number of fish . The King crab industrywhich at present averages 76.5 million lbs per year, the 5.5 million lbs. of Dungeness crab that is now processed annually. Tanner

crab, which were not even fished in any volume prior to 1969 now averages 1.8 million lbs catch per year and the shrimp fishery developed basically out of Kodiak now produces over 100 million lbs per year. Add to this the amount of new jobs created and new processing facilities developed to handle these products on a substantially year round basis, along with salmon and you have to show a noticable contribution to the growth of the economy of Alaska.

The Socio-Economic impact on the Cordova area should OCS oil develope, and regardless of what the present Cordova City Counsel and Chamber of Commerce have to say, would be devastating. At present for our normal population we do have adequate educational, medical and recreational facilities. However our new sewage treatment facility will be hardly more than adequate for the present population , while the utilities such as water, electricity and telephone cannot be adequately supplied to the present inhabitants. Without complete and total revision of the systems , cordova would not be able to supply any additional heavy users.

Our harbor facilities right now are overcrowded and even with the planned expansion will barely take care of the fishing fleet. None of the presently used boats in the fishing fleetare capable of being converted into support vessels, and in all probability few of the fishermen will be able to obtain jobs on the support vessels should they so desire.

So what does a Cordova area fisherman , like myself , who has spent his life investing in and constantly upgrading his equipment in orderto more adequately provide for his family have to look forward to for the future of himself and his family should OCS oil be developed?

1- A practically promised, upwards to 50% reduction in the fishery and fish processing by the year 2000.

2- A drastic reduction in the quality of education now offered in the areas schools.

3- In adequate medical, recreational, sewage disposal facilities along with a shortage of necessary utilities.

4- A practically unimaginable increase in taxes, real property values, a probably insumountable overall cost of living created by over inflated boom dollars, along with a lack of about everything necessary for our present way of life.

5- Tremendous decreases in game animals and fishes that the present peopl of the area utilize heavily for subsistance. Both from pollution and increase human disturbance and pressure.

6- A marked increase in crime , violence and other adverse conditions brought on by any major boom.

To compensate for this, some of the displaced fishermen might be able to obtain a few of the unskilled jobs associated with the developement but be forced to sacrifice their life style.

As far as the city of Cordova is concerned , at present it could in no way stand the impact of even light developement. With no specifically designated impact funds to offset the necessary additional facilities required, well in advance of any impact, the city could not financially survive. The possible increased employment, even before the noticable decrease in fishery production, cannot possibly offset the tremendous costs for necessary facility additions. The Cordova City Council and Chamber of Commerce may state that they are ready and capable of handling the situation, but they are in fact just agroup of business men looking ofr increased business and not looking at any of the adverse effects that have to be taken care of along with it. All action taken by these two groups was initiated during the period when the major portion of the community was engaged in fishing and not available to comment on or activly take part in their decision. It is my opinion that these two groups will be forced to back down on their stands.

We of the CDFU feel that the Dept. of Interior is maximizing potential ecological disaster by holding this particular lease sale at the presently scheduled time. This OCS Oil developement will greatly increase the danger

of a major spill due to increased tanker and support boat traffic as it is superimposing this traffic on the already potentially heavy tanker and suppor traffic created by the trans-Alaska pipeline. As yet traffic lanes and contr facilities and systems for the overall traffic have not even been considered. Eventually controlled or not the volume of tankers and support boats to be using the area can only lead to a catastropic oil spill.

None of the ecolcgical baseline studies that are absolutly necessary have been done to actually anyones satisfaction. The entire EIS used possible comparisons with food chain life and findings based on the Gulf of Mexico , the North Sea or other areas. We are not dealing with other areas, we are dealing with the North Gulf of Alaskab which is entirely different from any place else in the world. The studies have to be conducted here and in a manner worthy of the ecological value , not in a hap-hazard fashion. To do it right, to do it in a just and accurate fashion takes time. And the values at stake are definitely worth the time. The fisheries of Alaska have been the backbone of Alaskas economy for a long time and should not be thrown out the window just to develope oil.

The visual graphic aids accompanying the EIS are little better assesments of catalogueing critical marine fishery habitats, anadromus fish streams and areas of highly concentratedfishing effort than if some child was turned loos e with a crayon and a map. Whole areas of fisheries are excluded, no cataloguing of species by importance or value. Whole moose populations are excluded, erroneous weather and sea conditions are extended as fact-- These illustration are so bad that they had to be marked that the Dept. of Interior would not guarantee their accuracy . And why not, because the studies necessary to support these illustrations as well as practically the entire EiS have not been done . Nor will they be done if this lease sale is allowe to go on as scheduled. The entire EIS and these hearings for that matter appear to have been published and held just to follow the letter of the law

But completely disregarding the moral obligations of it.

One of the major concerns of not only our area but of the entire west coast, is the fact that at some time during their life cycle almost all the salmon from the pacific states pass through the lease zone area. This fact is not even acknowledged in the EIS.

We are just now receiving preliminary reports on the effects of Prudhoe Bay oil on anadromus fish through various stages of developement. The facts are in no way pleasant to read. The studies done at Auke Bay on Prudhoe Bay crude versus pink salmon eggs, alevins, fry and fingerlings have clearly demonstrated critical damage will occur from either large oil spills or chronic low level pollution. Equally or even greater damage has been demonstrated on Tanner crab the principle shellfish of the area.

Overall the federal governments current five year program to catalogue, research and define the fisheries resources associated with the North Gulf of Alaska OCS Oil development is unbelievably inadequate. IN fact, none of the obvious inshore or offshore resources utilized by U.S. fishermen are even part of the program as far as we can tell. The National Marine Fisheries Service seems pre-occupied only with dedfining the possible impact on ground fish utilized by foreign fishermen. There is no program to assess the salmon, herring and shellfish inshore of the 3 mile limit; Prince William Sound and the Copper River Delta are not even in the OCS Study program despite their extremely vunerable position, immediately downwind and down current from most of the proposed lease sale zones.

Weather and seismic conditions of the area by themselves should be enough to slow down the present action. Weather conditions as represented in the EiS are in our opinion another area of gross inadequacy, these conditions should be studied accurately and over a period of time. The Eis itself states tha t

'n the world. The geographic conditions of the area tend to increase and complicate the wind and storm patterns.

As yet there has been no equipment developed that can even hopefully ~~xxx~~ recover spilled oilfrom these waters except under thed most ideal of conditions and beleive me it isn't very often in the gulf you find these ideal conditions. The worst part ~~b~~ing of course the fact that during the far from ideal conditions period is when major catastrophys are the most likely to occur. So we are faced, at least at present , with the ugly fact that when it happens we in the P.W.S. and C.R. area will get the gruesome results.

Conditions brought on by seismic actions, when they will happen, and of wha magnitude are of course anyones guess, however we do know that the lease zones are locatred in one of the most highly active seismic areas of the world. this fact in itself adds greatly to potential environmental dammage.

We also cannot find who is responsible for monitoring and policing OCS evelopement. This is a area that certainly has to be considered Neither can we find who is responsible for damages to the fisheriesand the fishermens gear and incomes through this oil developement.

When I first starteed reading the EIS , I was of a mind to take notes o n errrors and ommissions, I found within the statement. However I soon realized my notes would soon be greater ~~xxxxxxx~~ in volume than the EIS itself. So with this testimony I have tried to hit upon some of the greater ommissions and errors, however a considerable amount of written testimony will be forthcoming from our area to be included in the final impact statement.

In conclusion I would like to state that the Cordova District Fisheries Union advocated delay of the proposed lease sale #39 in the North Gulf Alaska until such time as---

1- SaTisfactory baseline studies are made on the eco-system involve d and the marine resources of the area are catalogued and evaluated.

2--Technology is developed to safely produce the OCS oil of the area, considering all the factors of weather, seismic activity etc. and ability to produce this oil without the chronic low level polution.

3- Adequate control of tanker traffic and support systems are designed.

4--Impact funds are provided to offset the potential population explosion.

5-- Proper plans are made to monitor and police pollution from OCS developement.

6--Equipment is developed that can handle oil spill~~s~~ cleanup under the existing conditions, not just under ideal conditions.

7--Liability for damages suffered by the fisheries are placed squarely on someones shoulders. This would require both a detailed , ongoing monitoring programand a fund for payment of damages to fishermen and fish processors.

8-- Proper weather and current studies in the lease zone are carried out.

We will enlist the help of any organization or agency or action available to us to see that these necessary studies and provisions are met.

While we are not totally against OCS developement in this area, we feel that the selection of the North Gulf of Alaska for early OCS development is foolhardy in view of the great environmental risk.

I compare the Dept. of Interiors actions toward this accelerated lease sale much as a overanxious potential father, who rather than gain his desires in a rational way, trys impregnating nine women in order to only have to wait one month.

Thank you

Robert H. Blick

Pres CAMC

Chm CDFG

A RESOLUTION SUPPORTING THE LEASE/SALE OF PARCELS OF THE GULF OF ALASKA BY THE FEDERAL GOVERNMENT FOR THE PURPOSE OF OIL EXPLORATION AND PRODUCTION.

WHEREAS the City of Cordova, Alaska is a rural coastal community with approximately 2,500 people, and

WHEREAS the main industry of Cordova is the seasonal fisheries and fishery related processing and marketing, and

WHEREAS the Chamber of Commerce supports new industrial growth which will provide sustained employment and long term economic benefits for the City of Cordova, and

WHEREAS the economic impact will offset many of the detrimental sociological and environmental effects, and

WHEREAS the nation is in crucial need of oil and it's related products.

NOW THEREFORE BE IT RESOLVED that the Chamber of Commerce of Cordova, Alaska:

1. Supports the proposed lease/sale of tracts in the Gulf of Alaska by the federal goverument.

2. Supports the development of federal and state impact funds for affected coastal areas including interim impact funds prior to production.

3. Urges cooperation between the oil and gas industry and the fishing industry while engaged in common grounds.

4. Urges base line studies to assess the existion fishery resources inside the 3 mile limit on the Gulf Coast and in Prince William Sound as they are adjacent to purposed lease areas.

5. Welcomes and accepts the responsibility to work with both the fishing industry and oil industry for the mutual benefit of Cordova.

RESOLUTION #75-25

A RESOLUTION SUPPORTING THE LEASE/SALE OF PARCELS OF THE GULF OF ALASKA BY THE FEDERAL GOVERNMENT FOR THE PURPOSE OF OIL EXPLORATION AND PRODUCTION

WHEREAS, the City of Cordova, Alaska is an incorporated Home Rule City with approximately 2,500 people, and

WHEREAS, the main industry of Cordova is the seasonal fisheries and fishery related processing and marketing industry, and

WHEREAS, the citizens of Cordova experience severe economic fluctuation because of the seasonal industry, with high winter unemployment, and

WHEREAS, the fishery industry has been on an economic decline and any improvement to the industry will take several years, and

WHEREAS, the City of Cordova hopes to broaden industrial growth in the Cordova area to provide more employment and a better way of life for its residents, and

WHEREAS, the federal government realizes the potential of oil in the Gulf of Alaska and the need for oil exploration and production,

NOW THEREFORE BE IT RESOLVED that the City Council of the City of Cordova, Alaska:

1. Supports the proposed lease/sale of tracts in the Gulf of Alaska by the federal government.

2. Urges the Hammond administration of the State of Alaska to support the lease/sale.

3. Urges the oil and gas industry to cooperate and work with the fishing industry while sharing common ground.

4. Welcomes the opportunity to work together with the oil industry to promote a harmonious and fruitful relationship.

PASSED AND APPROVED THIS 24 DAY OF June, 1975

Mayor

Clerk

RESOLUTION #75-27

A RESOLUTION ASKING THE FEDERAL GOVERNMENT TO PROVIDE IMPACT ASSISTANCE TO CORDOVA AS A RESULT OF GULF OF ALASKA OIL ACTIVITY

WHEREAS, the Department of Interior is planning to hold a lease sale this year that would lead to exploration and drilling in the Gulf of Alaska;

WHEREAS, the City of Cordova has gone on record by unanimously passing Resolution #75-25 supporting the proposed lease sale and;

WHEREAS, the costal communities of the State of Alaska, especially Cordova, can reasonably expect to receive major influxes of people and a demand for services which reasonably can not be provided by our citizens,

NOW THEREFORE BE IT RESOLVED that the City of Cordova asks the federal government through the congress and Department of Interior to enact immediate legislation to provide adequate programs by which federal revenues from such leases and activities are shared with state and local communities at the outset of this development to fully offset this federally sponsored activity.

PASSED AND APPROVED THIS 11 DAY OF August, 1975.

James A. Poor, Mayor

Donna M. Sherby, Clerk

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INSTITUTE OF SOCIAL, ECONOMIC
AND GOVERNMENT RESEARCH

UNIVERSITY OF ALASKA
FAIRBANKS, ALASKA 99701

August 15, 1975

Mr. Edward J. Hoffmann, Manager
Alaska Outer Continental Shelf Office
Bureau of Land Management
P.O. Box 1159
Anchorage, Alaska 99510

Dear Ed:

Attached is my cleaned up testimony on the draft EIS for the Northern Gulf.

I will not have an opportunity to do a detailed job, though could someday go over some specific points if anyone has time and the interest.

More important, I have developed some ideas on how a cooperative effort could be developed to both prepare a coastal management plan and meet EIS requirements. It would probably require 12 months or so. Therefore, there is no need to pursue unless there is a decision to hold off on the lease sale.

I hope and trust that you did not take my highly critical testimony in a personal way. It certinaly was not intended that way. It's just that the whole process, with all its constraints, was a bit preposterous.

Best wishes,

Vic

Victor Fischer
Director

VF/dml

Enclosure

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Testimony of Victor Fischer, Director, Institute of Social, Economic and Government Research, University of Alaska, for the Department of the Interior hearings on the Draft Environmental Impact Statement, Outer Continental Shelf: Proposed Oil and Gas Leasing in the Northern Gulf of Alaska. Anchorage, Alaska, August 13,, 1975.

My name is Victor Fischer, I am the director of the Institute of Social, Economic and Government Research of the Univeristy of Alaska. I am testifying in a personal capacity.

I have been somewhat reluctant to get involved in this hearing at all because I've had an uneasy feeling that all this is simply a pro-forma farce intended to legitimize a decision already made. While the draft EIS contains statements that no leasing decision has been reached and that none will be till the final EIS is prepared and reviewed (pp. 22-24, 27), Secretary Hughes has made repeated public statements to the effect that the lease sale will proceed as scheduled, that the action is in the public interest, that there will be no delays. And that makes one wonder how real this proceeding is.

Despite these hesitations, however, I do hope and assume that we have a bona fide process, and that the environmental impact statement will be taken seriously within the Department of the Interior.

I will address myself strictly to the draft EIS and specifically to its socioeconomic and onshore impact analyses. It is here that my expertise and interest lie, and it is here where the main problems of the statement will be found.

In brief, it is my opinion that the draft EIS is totally inadequate, both in terms of meeting requirements of National Environmental Policy Act and regulations issued under it, and in terms of dealing with the likely impacts resulting from the proposed Gulf leasing action. In fact, I believe that the statement is irresponsible, 1) in the way it underestimates and refuses to deal with impacts of the sale and probable resultant development and, 2) in the almost total absence of consideration for the context and many related events within which the developments will occur. The methodology is too limited and inadequate for the task, and many available sources and materials, existing and potential, have not been utilized in preparation of the EIS.

(I would, by the way, like to mention that while I am extremely critical of the scope and quality of the draft statement, I am not in any way condemning the people who prepared it. They struggled valiantly to put the draft together, despite

ridiculous time, manpower, and other constraints that were imposed on them by those who have been in such a hurry to get something out in time to meet Interior's OCS schedule.)

I would first like to summarize where, in my opinion, the draft EIS is inadequate with respect to NEPA and the Council of Environmental Quality guidelines for preparation of environmental impact statements:

1. The description of the proposed action is deficient in not taking adequate care to identify population and growth that may be directly and indirectly affected by the proposed actions. The regions and areas likely to be impacted are not fully reflected in the EIS.

2. Probable impacts of the proposed action are not adequately set forth. Primary and direct consequences are not projected fully or accurately; methodologies are extremely deficient. Treatment of secondary and indirect consequences is extremely deficient. (Note, by the way, the CEQ regulations emphasize that "secondary effects . . . may often be even more substantial than the primary effects of the original action itself.")

3. Alternatives are not adequately considered, particularly in their relation to everything else that may occur in relationship to energy and OCS development in Alaska.

4. The required information is certainly not conveyed succinctly in an easily understood form. If anything, the

statement is a hodgepodge of miscellaneous information, much of it irrelevant, most of it not properly interrelated and constructively analyzed.

5. The social sciences are not adequately covered in terms of meeting the NEPA requirement for utilization of "a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and decision-making which may have an impact on man's environment."

It would take another tome, and more time than I can give, to provide you with a complete, detailed critique of the draft environmental impact statement. I will here cover some of the deficiencies and problems that I consider most significant, and will privide some further detail in a supplemental statement if I have a chance to do so.

1. Assumptions (I. C., pp. 6-13) The assumptions and scenarios outlined in the first part of the draft statement are inadequate to establish an effective basis for projecting on-shore impacts of OCS development. Lack of adequate attention to complete scenarios results in subsequently limited descriptions of existing socioeconomic environments and highly questionable projections of impacts.

The extremely cryptic assumptions and development scenarios are not properly substantiated and developed. All in all, they appear to be extremely conservative, consistently

underplaying probable impacts.

2. Developments not adequately covered. The draft EIS treats the proposed lease sale virtually in isolation, completely ignoring or treating lightly other activities and developments affecting communities, the region, and Alaska. This results in undercutting impact analyses and downplaying cumulative efforts of OCS development. In particular, thorough consideration needs to be given to this proposal stimulating State of Alaska on-shore and off-shore leasing in the Northern Gulf of Alaska area adjacent to federal leases, to further federal OCS leasing in the Gulf and other parts of the state, to the effect of pipelines bringing oil and gas from the North Slope to Gulf ports, and to processing in the affected region of natural gas transported from other regions of the State.

3. Description of social and economic environment. (II.E., pp.215-317). Area coverage is inadequate. Descriptions are often irrelevant, frequently incomplete, use non-current information (e.g., Valdez impacts of pipeline terminal development are ignored), and contain a variety of errors and improper citations. The discussion of land use controls implies that there are some, when in fact there is no effective land planning or regulation in most areas likely to be affected by OCS development.

4. Future environment without the proposal (II.F, pp. 317-319). This section says exactly nothing. It is not

enough to say that the nature of future changes cannot be foreseen in detail when regional and other projections could actually be developed.

5. Impact of the social and economic environment

(III. E., pp. 491-596) Aside from not taking into account the earlier-mentioned related and unrelated developments that may interact with the effects of the proposed leasing action, this part of the draft EIS suffers from horrendously bad methodology, poor structure, and extremely incomplete impact analysis. Generally, impacts are seriously underestimated and underrated. In part, this is the result of inadequate assumptions and too limited a scope of impact projections.

Aside from questionable projections of direct employment and population effects, the study collapses because of some ridiculous methodology used in projecting and distributing induced population (pp. 588-595). The section starts off by using a statewide projection of the relationship between workforce and population, and applying that to the OCS analysis; that's no way to go, for there is no basis for assuming that the statewide relationship applies here. Worse yet, a "hypothetical distribution" of population is then made, allocating total projected induced population according to 1970 census distribution in the South-central Alaska coastal region. There is no rationale whatsoever to assume that OCS-induced growth will be distributed according to

some past relationships having nothing to do with OCS development. In fact, it is patently wrong to make such an assumption.

This methodology results in the ridiculous conclusion that the induced population increase in Kodiak will be greater than the total growth impact of Cordova, Yakutat, Seward, Valdez and Whittier combined. And Kodiak is not even in the area that will be affected by the proposed lease sale!

The critical problem is that these projections are then used to look at the growth impact of each of the potentially affected communities, with the obvious result that impacts are severely underestimated; to my mind, the underestimation is perhaps several orders of magnitudes. This to me completely voids the bulk of the discussions of community and land use impacts, which discussions are pretty bad even without this gross error.

The coverage of impacts of the Alaska economy is also inadequate, again not taking into account the effect of other possible developments throughout the state that will interact with those of this proposed lease sale. What statewide projections are used utilize limited development scenarios, not even including future OCS development projected by the Interior Department.

In summary, this part of the draft EIS is totally inadequate. Impacts are consistently underestimated, giving a false picture of likely effects of the proposed lease sale.

6. State and local planning and management (III.G. 3 & 4 pp. 616-617). The draft EIS places continuing reliance on a state coastal zone management program and on zoning regulations administered by municipalities of the state. (See also pp. 309-313). Except in a few communities, no plans, management programs, or zoning exist. Impacts are already being felt, and suggesting that impacts will be generally modest and not be felt for many years, as is done in the report, ignores the fact that it will be some time before plans and management programs can be developed.

7. Mitigating measures. The whole discussion of mitigating measures does not deal with adverse social and economic impacts and what can be done about them. It would seem quite feasible to suggest a variety of things the government could do to help mitigate impacts.

8. Adverse effects that cannot be avoided. This part cavalierly states that the federal government has no authority to mitigate social impacts and thereby implies that the government needs to do nothing about them. This conclusion is reinforced by the continuing downplaying of projected impacts, based upon the earlier-discussed erroneous analyses. And, again, the broader social and economic impacts are totally ignored.

It is these general problems as well as the many specific deficiencies not mentioned here, that bring me to the conclusion that the draft EIS is woefully inadequate. Rather than talking about the alternatives discussed in the draft, I would like to quote this statement from BLM's own Final Environmental Statement on the proposed Increase in Oil and Gas Leasing on the Outer Continental Shelf issued earlier this year:

> The State of Alaska is probably the most ill-equipped region to handle the pressures of OCS development ... a long lead time will be necessary for Alaskan development, time in which to begin preparing for these impacts if a decision is made to proceed with such development. (pp. 213-214)

I believe the government should heed its own counsel and take the time necessary to perfect a satisfactory EIS and begin preparing honestly for the impacts to come. There are two critical reasons for doing this:

First, no matter how much we want to pursue OCS development to accomplish national objectives or promote economic development or satisfy personal greed -- if you don't have a proper EIS, the OCS program will fail and be delayed for a long, long time, and the price will be much greater than facing up to the task now. As others have suggested, trans-Alaska pipeline history will repeat itself, and for the same reasons.

Second, the impacts of OCS development in the Gulf and elsewhere are going to be extensive and severe, primarily because they will be occurring in the context of many other events and impacts. The growth projections our institute has made under the Man in the Arctic Program supported by the National Science Foundation show tremendous additional growth in Alaska over the next 15 years being generated as the result of oil and gas development occurring largely in response to federal policies. It is vital, therefore, that you do not shirk the government's responsibilities in this area.

In conclusion, I believe that both the national interest (however defined) and the state's objectives will be best served if you do the right kind of a job by the Northern Gulf of Alaska environmental impact statement.

Thank you.

Homer L. Burrell
P. O. Box 764
Anchorage, Ak. 99510
August 26, 1975

REMARKS FOR INCLUSION IN RECORD OF HEARINGS OF AUG. 12 & 13, 1975, ANCHORAGE, ALASKA, REGARDING A POSSIBLE OIL AND GAS LEASE SALE OFFSHORE NORTHERN GULF OF ALASKA.

My Name is Homer L. Burrell, and I was director of the Alaska Division of Oil and Gas for over six years. The Alaska Division of Oil and Gas is the regulatory body that oversees oil and gas drilling and producing operations in Alaska.

I have reviewed the draft Environmental Impact Statement, and consider that it does an adequate job of setting forth the potential impact of oil and gas operations in the area of the proposed sale.

Those that object to the sale seem to fall into one or more of three categories:

1. Those that wish to obtain a contract for rewriting all or portions of the Environmental Impact Statement;

2. Those that seek to delay the sale as a means of "blackmailing" the United States Congress into some form of revenue sharing with the adjacent state;

3. Those that seek to delay the sale because they believe that more data or information is required before a valid judgment can be made on whether or not to hold the sale.

There is little reason to discuss the first group. As for the second group, I would point out that there will be

very slight impact on the coastal communities for many years, because it is unlikely that a first exploratory well could be drilled by the Summer of 1976, owing to unavailability of drilling equipment. And if a well were drilled by mid-1976, it would be a minimum of five years before there would be regular production, even assuming that oil or gas is found in commercial quantities. This is because of the very short drilling season in the Gulf of Alaska, the necessity to drill confirmation wells after discovery to determine whether or not the field is commercial, and the delays in designing, ordering and installing the necessary production platforms and pipelines to shore, as well as the on-shore facilities required. During this period of time, the United States Congress can determine what revenue sharing will be permitted.

Those whose objections are set forth in the third category above apparently believe that there will be some new information or technological breakthrough within six months or two years that will make drilling more environmentally safe than it is now. There is no evidence to substantiate this hope. Indeed, proponents of this view have apparently overlooked the energy crisis within the United States, and our dependence on imported oil.

For the record, it should be pointed out that the Outer Continental Shelf adjacent to the States of Oregon and

Washington was leased in the mid-1960's, and several wells were drilled. All these wells were unsuccessful, and there was no appreciable impact on the coastal communities as a result of these operations. The same is true of the Desten Anticline off the coast of Florida, which was recently leased by the Department of the Interior, and on which some seven wells were drilled, all unsuccessful.

Inasmuch as states adjacent to Outer Continental Shelf operations have a valid interest in the conduct of these operations, I respectfully recommend that adjacent states share technical information with the United States Geological Survey and that appropriate state personnel be permitted on the drilling boats or platforms, in an advisory capacity to the federal regulatory personnel.

I also recommend that the primary term of the OCS leases be changed from five years to ten years, since the five year lease was designed for the Gulf of Mexico, where year-round operations are possible. In the Gulf of Alaska, exploratory operations from drilling boats can be conducted for only about three months of each year.

Thank you for the opportunity to have these remarks included in the record.

Howard L. Burrell

Testimony on Draft Environmental Impact Statement
Proposed Oil and Gas Leasing in the
Northern Gulf of Alaska (Sale No. 39)
(42)
Testimony by Ruth E. McHenry
Box 1333
Seward, Alaska 99664
At Anchorage, Alaska, on 13 August 1975

I am a thirty-year resident of Alaska and a six-year resident of Seward. I am testifying as a private citizen. I hope that my testimony will also reflect the opinions of many Sewardites who are not members of the Chamber of Commerce or City Council, and who, therefore, are not usually heard from.

This environmental impact statement fails to explore in depth certain types of impact, and certain other types are not discussed at all. I would like to mention three of these deficiencies:

I. Impact on lifestyles in non-Native communities is not discussed.

A very bland, limited discussion is given to impact on lifestyles in Native communities. It is even contradictory: On page 497 is the statement that "It is unimaginable that 10 to 20 plus years of OCS oil exploration and production activity, at whatever magnitude, would not have irreversable effects on the Yakutat people and their village." On page 704, however, is the contradictory claim that "Only if population inducements rise significantly above those projected in this draft EIS would Yakutat have its traditional native cultural lifestyle threatened."

Lifestyles of Natives and non-Natives in the predominantly white communities are not discussed at all. "Quality of life" is mentioned, but only in reference to sewage systems, schools and divorce rates. However, many Alaskans were first attracted to (or chose to remain in) these communities for quite different qualities. They could have enjoyed a higher standard of living, with better health care, more cultural events and even better weather, in one of the other states. The appeal to them was in the opportunities for outdoor activities--hunting, fishing, hiking --and for the enjoyment of scenery, the sense of closeness with nature.

The Secretary of the Interior, in reading the DEIS, cannot be expected to grasp this, for three reasons: First, these activities are always treated separately. We read in one section that hunters will experience more competition for game. In another section, we read that beachcombers may be unhappy about globs of oil. Elsewhere we read that clam-diggers may have to avoid oil-polluted areas. Nowhere is this all drawn together, so the effect is diluted. It is not stated that many individuals enjoy all these activities, each in its season, and that they stand to have their enjoyment of all these activities diminished or ruined by OCS development.

Secondly, the importance of these activities is downgraded because they are referred to as "recreational". In fact, many of them grade from recreational into subsistence. Alaskans rely on fish and game resources to a greater or lesser degree to supplement their diets and offset the high cost of living. The terms "sport hunting", "sport fishing", and "recreation" do not convey this, nor do they convey the other values of outdoor activities--the peace and solitude, the sense of self-reliance.

Thirdly, little reference is made to the fact that these activities are engaged in by local residents. I found a one-sentence reference to Cordova deer hunters and another to Valdez salmon sport-fishermen. Mostly, outdoor activities are treated as tourist attractions. The Secretary might understandably infer that fish and game, unpolluted beaches and natural scenery are important to the communities primarily as tourist attractions. He might conclude that adverse impacts on them can be compensated for by oil revenues.

II. Induced population figures are incomplete.

Induced population figures shown on page 588 do not include transitory persons who do not become residents. Transitory persons are defined as both those who leave after working for a while and those who leave after failing to find work. The statement does not even attempt to put a figure on the latter.

Also, the statement indicates a decline in induced population after 1984. It fails to explore the fact that Chambers of Commerce and local governments have traditionally been loath to allow a population to decline. They can be expected to clamor for more industry, including more sales in the Gulf. Furthermore, improved support services and facilities might well make feasible other developments which were previously uneconomical. These developments may even be in areas quite remote from the Gulf Coast--areas not discussed in this impact statement. Thus, this sale's "multiplier effect" will probably far exceed, both in magnitude and area, that postulated in the statement. This is especially troubling to those of us who recognize that, after Alaska has been developed and tamed, there will be no place left for us to carry on the way of life we have enjoyed in the past.

III. Other alternatives have not been given sufficient consideration.

Although energy conservation is listed as an alternative to Alaskan OCS development, the proposed conservation measures do not go beyond cutting of waste and inefficiency. The phrase, "major changes in lifestyles", is used, but--

other than "discouraging automobile use"--the proposals do not involve anyone's giving up anything or lowering his standard of living. Americans may be asked to build their homes with more insulation, but not to build smaller homes. Yet, it is well known that Americans consume all resources--not just energy resources--far out of proportion to their numbers. On a finite earth, this situation cannot continue indefinitely.

At the very least, this DEIS should have suggested the need for a study of alternate, less consumptive modes of living for Americans. I believe that OCS development should be deferred until such a study is made and its suggestions implemented. Only if, at that time, OCS development still appears necessary, should it proceed. This may sound radical, but it is hardly as radical as what OCS development is expected to do to Alaska--its environment, its resources and the lifestyles of its inhabitants. I, for one, see no reason why my way of life should be sacrificed to the American standard of living.

(43)

Tom Fink, C.L.U.

P. O. BOX 1066, ANCHORAGE, ALASKA 99510
PHONE 907 / 279-2522

Testimony to BLM on OCS

August 12, 1975

Gentlemen,

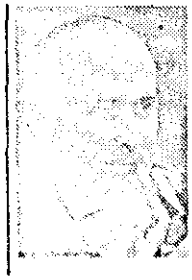
I am Tom Fink, private citizen, a twenty-three year resident of the Anchorage area. I have served a little over eight years in the Alaska Legislature and in 1973 and 74 was Speaker of the Alaska House. I wish to urge that you proceed with the Outer Continental Shelf Sale in December of 1975. I'm convinced it can be done in an environmentally safe manner and any further information that you need to assure the safety, you can gather while the industry is exploring for oil.

I've attached a copy of an article which I wrote indicating that the economic impact of the Outer Continental Shelf will be positive from the viewpoint of the State rather than negative.

And most importantly, I'm convinced that the United States must develop, and soon, adequate domestic energy so that we are independent of other countries of the world for purposes of our security and secondly to get our economy moving.

Thank you.

August 3, 1975, Anchorage Sunday Times A-7



Alaska Can Afford OCS Development

By Tom Fink

IN THE NEXT several weeks the commissioner of natural resources is going to try to convince visiting congressmen that Alaska cannot afford the impact of the Outer Continental Shelf oil and gas lease sale. If the commissioner wants to tell the congressmen of the many undesirable facets of the impact, he should say it in just that way.

If he wants to tell the congressmen we can't stand the fiscal or economic impact

LAST YEAR on June 30 we had 140,000 people employed in the state. This year on June 30 we have 170,000 people employed — a 21 per cent increase. The number of people unemployed on June 30 last year and this year is the same, at 16,000.

The Greater Anchorage Area Borough had an assessed value of $1.6 billion in 1972 and has an assessed value of $2.7 billion today — a 70 per cent increase. The millage rate is slightly reduced.

constant stream of visitors, from Anchorage, Valdez, Fairbanks and all points in between, requesting the state do whatever it had to do to get the pipeline built. The cities, particularly Valdez and Fairbanks, indicated approaching bankruptcy and stated their only salvation was the pipeline. Now, the media has made much of the inconveniences and disturbances caused by the impact.

There are many inconveniences and bad aspects of any kind of development. But

(49)

DATE: August 4, 1975

FILE NO.

SUBJECT: Outer Continental Shelf

Mr. Edward J. Hoffman, Manager
Alaska OCS Office
Box 1159
Anchorage, Alaska 99510

Dear Mr. Hoffman:

On behalf of the City and Borough of Juneau, Alaska, I would appreciate the following statement be entered into the formal record.

The City and Borough has completed its review of the Draft Environmental Impact Statement, Outer Continental Shelf, Proposed Oil and Gas Leasing in the Northern Gulf of Alaska. Although we do not have sufficient expertise to adequately analyze and prepare meaningful comment on the potential environmental affects of the OCS program on the ocean and seas and its marine life, we have been able to evaluate the section entitled "Social and Economic Environment of the Northern Gulf of Alaska Coast."

We have determined that a serious error was made by the authors of the Statement in that the City and Borough was not included in the group of Alaska communities which might be impacted by this proposed leasing program. The direct opposite is the case with the recently completed Gulf of Alaska Operators Committee's report An Economic and Social Impact Study of Oil Related Activities in the Gulf of Alaska. This report extensively includes the City and Borough of Juneau in its on-shore analysis. If the oil companies chose to include us, and they did for good reasons, why should not the Federal government?

We would also like to point out that on February 7, 1975, a position statement was forwarded to the Department of the Interior relative to the Outer Continental Shelf hearings in Anchorage which were held on February 3 and 4. In that letter we suggested that when more precise environmental impact statements are developed, the Juneau area should not be ignored but its potential evaluated to serve

as a support community.

We have also received written concurrence from Governor Jay Hammond and Commissioner of Natural Resources Guy Martin that this area should be evaluated as a support area for OCS development as a part of our economic diversification effort. Still, even with all of this, we have not been included.

It could be argued that the proposed lease sale, which is situated on both sides of Kayak Island between Cordova on the west and Icy Bay on the east, is too far removed geographically from the Juneau area. We do not agree. The EIS does include Anchorage, which is also substantially removed geographically from this particular lease area. The Anchorage area is included because historically that is where the oil companies have been located and where sources of housing, transportation, communications, supplies and social amenities are concentrated and available. The Juneau area may not have the oil companies, but it does have many of the other amenities and necessities which would be required for on-shore impact activities. It is our opinion that Juneau on the southeast and Anchorage on the northwest end could effectively absorb substantial on-shore OCS impact activity.

Prior to the completion of the Final Environmental Impact Statement, we anticipate and expect the Department of the Interior to include the City and Borough of Juneau with the communities that may be impacted by OCS drilling and development.

Sincerely,

Mirginia Kline
Deputy Mayor

STATEMENT CONCERNING PROPOSED OCS SALE
NUMBER 39, NORTHERN GULF OF ALASKA

My name is C. V. Chatterton, a registered professional engineer employed as Vice President by Rowan Drilling - U.S., the domestic operating division of Rowan Companies, Inc.

As an Alaskan for nearly fifteen years and as spokesman for a drilling contracting firm with twenty years experience in Alaska, I speak to the matter before us with not only a personal but also a business interest.

For credentials, Rowan offers fifty years of experience and expertise in the drilling of crude oil and natural gas wells. Rowan currently operates thirteen offshore drilling units, including two semi-submersible units in the North Sea, where climatic conditions are similar to the Gulf of Alaska.

Drawing upon a background of experience and expertise, it is our considered and sincere conviction that drilling and producing operations can be carried out safely within the site-specific of the proposed OCS Sale No. 39. Industry practices and technology necessary for safe operations exist and have been proved.

Crude oil and natural gas drilling and producing operations can now be conducted within the Gulf of Alaska without any significant or lasting effects upon the environment.

There are no viable alternates to the proposed action, short of leaving a much needed potential source of domestic energy lying fallow beneath the sea. Drilling and producing operations within the site-specific can now be conducted in full compatibility with any other demands placed upon the area. Development of this potential energy reserve will prove economically beneficial to all.

In short, we support early implementation of proposed OCS Sale No. 39. Delay will serve no useful purpose with respect to environmental, economic or social considerations.

Thank you for the opportunity to appear before you.

ROWAN DRILLING - U.S.

A Division of ROWAN COMPANIES, INC.

C. V. Chatterton
Vice President

(46)

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Alaska State Legislature

House of Representatives

COMMITTEES
STATE AFFAIRS
LABOR AND MANAGEMEN

August 11,1975

REMARKS GIVEN AT OCS HEARINGS IN ANCHORAGE, August 12 - 13,1975

Mr. Chairman, and Members:

My name is M.F. "Mike" Beirne. I am a medical doctor practicing in Anchorage, and I specialize in pathology and forensic medicine. I am also a member of the Alaska State House of Representatives.

I support strongly the immediate exploration and development of our outer continental shelf areas.

In my opinion, America must have this immediate exploration and development of the outer continental shelf. Adequate environmental safeguards are proper and necessary. However, these safeguards must be reasonable in every respect so that we do not add unneccessarily to the cost of living. Certainly, we consumers ultimately must pay any and all bills, and all costs related to these environmental safeguards as well as for the exploration, development, and marketing of our petroleum resources. The consumers, the taxpayers, the citizens, always pay the bills.

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Alaska State Legislature

House of Representatives

COMMITTEES
STATE AFFAIRS
LABOR AND MANAGEMEI

August 11,1975
M.F."Mike" Beirne
Remarks given at OCS Hearings in Anchorage August 12-13,1975
Page Two

Certainly we have to use our petroleum resources, but not wastefully; we cannot afford that. Some people call for no growth, or even limited growth, or retarded growth. I suspect those people may be so comfortably situated in life that they aren't thinking of the average consumer. Or maybe they get a check from home each month, or from the government each month, and that gives them a choice to live out in a sleeping bag. Maybe they just don't know what they are advocating. But I know what I want, and I want immediate development.

I think we all know what a significantly reduced level of energy use in this country would do to us. The Arab embargo gave us a quick clue. Hundreds of thousands, or perhaps even millions of Americans out of a job, is not my idea of progress. And paying the Arabs billions of dollars a year for oil that we have right here doesn't make any sense to me either. We have a choice. We have an opportunity. And it lies, for the most part, beneath the waters along America's coast lines, and half of that coastline is around Alaska.

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The Federal government, I realize, has the difficult and perplexing problem of determining actually what is in the nation's best interest regarding OCS oil and gas development.

The draft environmental impact statement no doubt raises some frightening questions. There are never any satisfactory answers to these type of questions. I call them "What if" questions.

For example let me draw an analogy.

Suppose that before a man and woman could begin a family that an impact statement would have to be prepared. And that statement would be developed by the appropriate specialists in the field. A doctor could point out for example that unquestionably it would be statistically possible for some of the children to be born with deformities. The psychiatrist could project with a great deal of certainty that some offspring might possibly be mentally retarded, or perhaps even criminally insane. Another specialist would no doubt, feel compelled to point out the possibility that one of the children might grow up, contact some dreaded disease like bubonic plague, attend the baseball World Series and spread that disease to thousands of his fellow human beings.

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COMMITTEES
STATE AFFAIRS
LABOR AND MANAGEME

This is certainly not an attempt at ridicule, on the contrary, all I am saying is that given the assignment to project what possibly could happen when a certain action is taken, that dedicated, sincere individuals will tend to raise questions for which there are no totally satisfactory answers.

Finally, someone has to weigh the evidence , and to make the decision which seems best in light of all the available data. In this case, I presume this burden will fall on the Secretary of the Interior.

I hope his judgement is to proceed with an oil and gas lease sale in the Gulf of Alaska this fall. I believe this would be in the best interest of the nation, of Alaska, and of the consumers.

U. S. DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

HEARING ON PROPOSED LEASING IN THE GULF OF ALASKA

Ladies and Gentlemen:

I am Joe W. Tyson, Senior Scientist for the Gulf Universities Research Consortium (GURC), now Houston, Texas. I am appearing today on behalf of GURC at the request of the Gulf of Alaska Operators Committee.

As some of you may know, GURC is a research oriented organization which counts in its membership 20 universities with interests in the Gulf of Mexico.

During 1972-1974, GURC, at the request of a number of companies, initiated its Offshore Ecology Investigation to answer the deceptively simple question; "what is the measureable impact of drilling for oil, and later producing it on the estuarine and marine environment of the Louisiana outer continental shelf, the nation's greatest offshore oil producing region?" After an intensive study costing more than 1½ million dollars, the conclusion reached by GURC is that the drilling and subsequent production of petroleum products off of Louisiana has had no major lasting adverse affects on the marine environment and may even have been beneficial to some life forms. SLIDE #1

In appearing here today, I fully realize that the Gulf

STATEMENT OF

CLAYTON D. McAULIFFE
CHEVRON OIL FIELD RESEARCH COMPANY

VICE-CHAIRMAN, ENVIRONMENT AND BIOLOGY
STANDING COMMITTEE
GULF OF ALASKA OPERATORS' COMMITTEE

before the

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HEARING

on

PROPOSED OIL AND GAS LEASING

on the

OUTER CONTINENTAL SHELF

NORTHERN GULF OF ALASKA

ANCHORAGE, ALASKA
AUGUST 12-13, 1975

GULF OF ALASKA OPERATORS COMMITTEE

Statement of Clayton D. McAuliffe,
Chevron Oil Field Research Company

OFFSHORE SALE ENVIRONMENTAL HEARING

Anchorage, Alaska

I am Clayton McAuliffe, Senior Research Associate, with Chevron Oil Field Research Company, La Habra, California. I received my doctorate in Soil Science with minors in Physical Chemistry and Plant Physiology from Cornell University, and was a professor at Cornell University and North Carolina State University for 8 years before joining Chevron Oil Field Research Company 19 years ago.

I am a member of the American Chemical Society, The Soil Science Society of America, the American Society of Agronomy, a member and Fellow of the American Association for the Advancement of Science, the Society of Petroleum Engineers and several honorary societies. I have published over 40 papers covering a variety of subjects in scientific journals and I have a number of U. S. and foreign patents.

For over five years I have devoted my time almost exclusively to a study of petroleum in the marine environment. I assisted in the planning and coordinated the extensive chemical and biological studies conducted during and following the 1970 Chevron oil spill in the Gulf of Mexico. I performed a similar function following the collision of the tankers in San Francisco Bay in 1971. I served on the Steering Committee of the National Academy of

Sciences Panel on Inputs, Fates, and Effects of Petroleum in the Marine Environment which resulted in the recent NAS publication "Petroleum in the Marine Environment". For the past four years I have been associated with the American Petroleum Institute's Committee on Fate and Effects of Oil in the Environment. I have also served on various other environmental and science advisory committees.

INTRODUCTON

Today I will review what happened to crude oil during a major oil spill as revealed by studies during and following the Chevron Gulf Coast spill and relate these results to the northern Gulf of Alaska to predict what would happen to the oil in the unlikely event that a major spill should occur. Before undertaking this I'd like to review some general observations concerning offshore crude oil spills.

As shown in Slide 1, the probability of a major oil spill is low. There have been only three major spills from offshore production platforms in the drilling of approximately 19,000 wells in the U.S. offshore.

Based upon the amount of oil discharged during these three major spills, it is predicted that if a major spill occurs in the Gulf of Alaska, it probably will range from 20,000 to 100,000 barrels.

Based upon past experience, a major oil discharge from an offshore platform may last for several weeks and possibly for a month or two.

During the period of oil discharge, it is obvious that the highest concentrations of oil will always be at the point of discharge.

To date the amount of oil discharged to the marine environment from offshore spills has been less than 2% that of the total petroleum input (National Academy of Sciences, 1975). As offshore production increases, the amount of oil discharged may increase, but probably will remain a small fraction compared with total input to the oceans. It may even become less because of improved drilling practices, and the employment of fail-safe valves in the oil wells.

As will be discussed in other testimony, the only documented adverse effects from major crude oil spills have been to some species of intertidal organisms when oil stranded on the shore (Straughan, 1971), and to sea birds if they were present. Therefore, efforts should be made to reduce the stranding of oil to an absolute minimum. I will later in my testimony make comments concerning a method for minimizing possible impacts of oil.

Some publications which have treated the issue of movement of oil spills have not given adequate recognition to the numerous changes which oil undergoes when discharged to the marine environment. Indeed, some studies on the subject have as a major assumption, the proposition that once oil is spilled, it will continue to drift around the ocean essentially unchanged for 50 or even 100 days. This assumption is clearly a false one, and it leads to unrealistic oil spill trajectories and hypothesezed adverse impacts of the oil.

I wish to devote the major portion of my testimony to the numerous changes oil undergoes before discussing possible oil spills and oil spill trajectories in the proposed lease areas of the northern Gulf of Alaska.

Although laboratory studies, visual observation of small oil spills at sea, and oil spill models provide some information, the extrapolation of the results of these studies to a major spill situation is largely speculation. I believe that the best prediction of what might happen in the event of a major spill in the Gulf of Alaska is to extrapolate observed results from a major crude oil spill (McAuliffe et al, 1975) with proper modifications for the different environment in the northern Gulf of Alaska.

When oil is discharged to the marine environment, it undergoes a number of rapid physical changes including spreading, dispersion, evaporation, solution, sedimentation, and emulsification. Beginning immediately, but proceeding at slower rates, are other crude oil alterations including biodegradation, photo-oxidation, and incorporation by marine organisms other than bacteria.

Of the three major offshore platform spills, chemical and biological studies were conducted only for the Santa Barbara and Chevron Gulf of Mexico spills. The Chevron study was one of the most comprehensive and diagnostic investigations ever made of an offshore crude oil spill. We believe that reference to this investigation and to the summary paper published in the Proceedings of the 1975 Conference on Prevention and Control of Oil Pollution held in San Francisco in March would be useful to the BLM in connection with the preparation of the final environmental impact statement.

MAIN PASS BLOCK 41 OIL SPILL

Chevron production platform C, Main Pass Block 41 Oil Field, located 11 miles east of the Mississippi River Delta in 40 ft of water, caught fire February 10, 1970. On March 10 the fire was successfully extinguished and oil was discharged until March 31 when the last wells were brought under control. During this three-week period, an estimated 35,000 to 65,000 bbls of crude oil was discharged. Assuming the higher value, the initial rate of discharge was approximately 6,000 B/D, decreasing to 1,500 B/D during the final week. As a safety precaution during the fire and oil spill, 2,006 bbls of chemical dispersants were mixed in water and sprayed on the platform and surrounding water surface. The addition of chemical dispersants (surfactants) breaks the oil into small droplets which do not stick to each other, but mix into water. An everyday example of an emulsion is cream. It is an emulsion of butterfat in water and it disperses when added to coffee.

Slide 2 shows the Mississippi River Delta region and the location of the Main Pass Block 41 C Platform. Shown on the slide is a composite of the surface oil slick during the three-week period of oil discharge. On most days the slick was about six to nine miles in length and 1.0 to 1.5 miles wide. On two days, with relatively calm weather, the surface slick was observed 40 miles to the south and on another day it extended a similar distance to the east.

Appreciable amounts of oil were emulsified by the dispersants. This emulsified plume extended no more than 1.0 to 1.5 miles from the platform which would be within the small circle drawn around the platform on the map.

During the last five days of the spill, water samples were collected in the immediate vicinity of the platform and outward at distances up to 30 miles. Water samples were collected from near-surface, mid-depth, and near-bottom. On three days, water samples were collected in the emulsified oil plume in areas which visually had the highest concentrations of oil-in-water emulsion in the near-surface waters.

Following the spill a large number of bottom sediment samples were collected for hydrocarbon and benthic organism analysis throughout the study area extending north as far as northern Chandeleur Sound and south around the Mississippi River Delta.

For a year following the spill, a large number of trawls collected fish, shrimp, and crabs. The trawls were made principally between the platform and the delta in order to intercept shrimp that would have migrated through the oil spill area.

Water, sediment, benthic, and trawl samples were appropriately analyzed and the next slides show what happened to the oil. Based upon the crude oil composition and verified by gas chromatographic analysis of oil samples collected from the water surface (Slide 3), between 25 and 30% of the oil evaporated into the atmosphere during the first 24 hours. Between 10 and 20% of the oil was

skimmed from the water surface even though the recovery devices were far less efficient than those which are available now, more than 5 years later.

Hydrocarbons dissolved in the water column were found only in the platform vicinity in the emulsified oil plume. All other waters contained dissolved hydrocarbons in concentrations of less than one part per billion (ppb). The dissolved hydrocarbons were low-molecular weight (less than 10 carbon atoms in the molecule) with about one-half the dissolved constituents being low-molecular weight aromatic hydrocarbons--benzene, toluene, xylenes, and trimethylbenzenes. These low-molecular weight aromatic hydrocarbons are considered to be toxic to biological life. Note, (Slide 3) that the dissolved hydrocarbon concentrations at the platform ranged from .02 to 0.2 ppm decreasing to 0.002 ppm (2 ppb) at approximately one mile. On one day, dissolved hydrocarbons were observed in mid-depth and near-bottom waters near the platform in the 2 to 5 ppb range. From the dimensions of the emulsified oil plume, the dissolved hydrocarbon concentrations in the water, the rate of oil discharge, and water current, it was possible to calculate the amount of oil that dissolved in water. The amount dissolved averaged 0.15% during the first two hours. Because the emulsion droplets were small, the rate of solution would have been rapid initially and than decreased with time. Therefore, it is estimated that less than 1% of the oil dissolved the first day.

Slide 4 summarizes what happened to portions of the oil. The concentrations of oil in the emulsion plume ranged from 2 to 60 ppm at the platform and decreased to 1 ppm at one mile. The oil was not found in mid-depth (20 ft) samples under the emulsion plume, showing that emulsified oil was only in the near-surface waters. Again, knowing the dimensions of the emulsion plume, concentrations, and flow rates, it was possible to calculate that from 10 to 50% of the oil was emulsified.

Analysis of numerous sediment samples by gas chromatography documented that crude oil settled to the bottom only within a five-mile radius of the platform. The concentrations for the C_{12}-C_{33} hydrocarbon fraction measured by gas chromatography and for total oil are shown ranging from 125 to 625 mg/l for the highest values with mean values of 31 and 151 mg/l of sediment.

To obtain an adequate amount of sediment for oil analysis, the top 1.5 inch interval of 2.0 inch diameter cores was extracted. The next lower 1.5 inch core interval analyzed did not contain Main Pass Block 41 crude oil, thereby showing that the sedimented oil was found only in upper 1.5 inches of sediment.

The remaining oil, not accounted for, is thought to have dispersed throughout the water column and possibly sedimented. It was diluted to such low concentrations as to be immeasurable.

In addition to these weathering processes, biodegradation was occuring.

Slide 5 compares the gas chromatogram for oil collected from the water's surface about 0.5 mile from the platform with chromatograms of oil in sediment samples located near the platform. The top

chromatogram of the partially weathered oil (loss of hydrocarbons below normal C_{13}) has marked normal alkane peaks sticking up like fingers and numbered from 13 through 35. Hydrocarbon oxidizing bacteria, found in all marine waters, apparently started to biodegrade the oil immediately as shown in the bottom 2 chromatograms. The normal alkane peaks are much reduced in the oil extracted from a sediment sample collected 2 miles south of the platform one week after the spill, and they are essentially gone from the oil in the sediment sample taken one month after the spill 3 miles south of the platform. The small normal alkane peaks visible in the bottom chromatogram in the C_{27}-C_{35} region are of biogenic origin.

Additional evidence of weathering is shown in Slide 6. Oil from Main Pass Block 41 identified by gas chromatography was measured at three locations after the spill and ranged from 50 to 125 ppm. Samples collected at these same locations (within 10 to 15 ft by accurate Raydist navigation) 11 months later had oil contents from 3 to 6 mg/l (ppm). These concentrations are approximately equal to background values for sediments from this part of the Mississippi Delta.

Although my testimony is principally to document what happened to the oil discharged during the Chevron spill, I do wish to make a few comments about the observed effects of the oil discharge on marine life.

We have just shown that the concentrations of dissolved hydrocarbons and oil emulsified in the water column were relatively low and diluted very rapidly. With a current of 0.5 knot, the

concentrations became less than 1 ppb at the end of a two-hour period one mile from the platform. Thus, even planktonic organisms moving with the water containing emulsified oil were subjected to low hydrocarbon concentrations for a very short period of time - short compared with bioassay tests which are normally conducted for 4 days. Bioassay data cited by the draft EIS and in Marine Bioassays Workshop Proceedings, 1974, show that much higher concentrations of oil and dispersed oil are required to cause half-kill of test organisms, including eggs, larvae, and juvenile stages.

Bioassay tests using six different species of organisms were conducted with Main Pass Block 41 crude oil and the two dispersants used during the oil discharge period. The concentrations of oil and emulsified oil required to cause one half-kill were much higher than the concentrations measured in the sea water at the time of the spill, and the exposure time was 4 days. These data would predict no measurable effect from the oil and emulsified oil on marine life. This conclusion was confirmed because no dead or distressed organisms were observed during the spill. Divers were under the platform on several occasions and observed fish, shrimp, and other marine life with no evidence of distress.

Planktonic organisms were exposed to low concentrations of oil for a short period of time and mobile organisms can leave the area, but benthic organisms living on and in the bottom sediments are sedentary. They were subjected to possible effects from the oil for the entire discharge period. Over 550 species of benthic organisms were identified in 233 benthic samples throughout the

study area. Within seasonal variations, bottom sediment type, and possibly other environmental parameters, it was not possible to measure an effect of the spilled oil on these benthic organisms. There was no correlation of number of species or number of individuals or other biological parameters with the hydrocarbon contents of sediment samples within a 10-mile radius of the platform. It is within this area that an effect, if one were to occur, would be expected from sedimented oil. This lack of correlation strongly suggests a lack of significant effect of oil on the benthic organisms.

The extensive trawl samples showed no alteration in the annual life cycle of commercially important shrimp. Blue crabs were observed throughout the study area, and the number of species of fish collected in the trawl samples in the study area were comparable to a previous survey conducted by the Louisiana Estuarine Inventory conducted along the entire coast of Louisiana.

I have attached a reprint of the paper summarizing the Chevron Chemical and Biological investigations to my testimony.

EXTRAPOLATION OF CHEVRON GULF SPILL RESULTS TO NORTHERN GULF OF ALASKA

Statements have been made that it is not possible to extrapolate the results of a study from one area to another. To a certain extent this is true, but good estimates can be made from such an extrapolation. Such an evaluation is much better than merely stating that we don't know what to expect in a new exploration area such as the northern Gulf of Alaska.

Life of a Surface Slick

During the Main Pass Block 41 spill, oil on the water's surface which left the platform in one direction on a given day, followed by a change in the wind which carried the oil in a different direction the next day, revealed that first day's slick could not be found on the second day. Details of individual slicks are given by Murray et al, 1970, and Murray, 1975. The fact that the slick extended on most days a maximum of six to nine miles from the platform with a 0.5 knot current indicates a maximum life of oil on the surface of 12 to 18 hours.

The discharge of this same crude oil to the waters of the northern Gulf of Alaska would probably show a somewhat longer life, but not to an appreciable extent. The University of Alaska study (Kinney et al, 1969) in the Cook Inlet indicated the half-life of a crude oil spill was less than one day with complete disappearance after four to five days. A similar observation was made, even in the winter time, for the spill that occurred at the Drift River terminal. The oil moved throughout portions of the Cook Inlet quickly, but was not observed to persist.

The Main Pass Block 41 crude oil was 34° API gravity. Cook Inlet crude oils have API gravities ranging from 35° to 45° and crude oils from the Katella oil field measure 41-45° API. If similar oils are discovered in the northern Gulf of Alaska, the rates of weathering and dispersion should be at least as rapid as

observed in the Cook Inlet. Because of higher winds and waves, the weathering and dispersion may be more rapid.

Evaporation

The rate of oil evaporation would be somewhat slower in the northern Gulf of Alaska as compared with warmer waters due to the lower vapor pressure of the hydrocarbons. If the temperature was 10°C lower, the rate of evaporation would be approximately one-half. The average water temperature during the Chevron spill was 15°C. The northern Gulf of Alaska water temperatures range from 4 to 14°C while nearshore waters range from 9 to 12°C. The maximum water temperature difference comparing the Chevron spill with the coldest northern Gulf of Alaska water would be about 10°C and sometimes less. Therefore, the maximum decrease in evaporation rate would be approximately one-half that observed for the Gulf of Mexico spill. However, the higher average wind velocities would increase the rate of evaporation in the Gulf of Alaska as compared with the Gulf of Mexico. The rate of evaporation increases linerally with wind speed. Higher winds would partially compensate for lower water temperatures and if wind velocity was twice that in the Gulf of Mexico, wind would completely compensate for water temperatures 10°C lower.

Dissolved Hydrocarbons

The rate of solution of hydrocarbons from a similar oil into the Alaskan Gulf water column would be somewhat slower than in the Gulf of Mexico because a similar oil would have a lower

viscosity due to lower water temperatures. The transfer of the hydrocarbons to water would be at a lower rate. In both the Gulf Coast and the Gulf of Alaska, hydrocarbons that do dissolve will either biodegrade or evaporate back into the atmosphere. Low molecular weight aromatic hydrocarbons have the highest hydrocarbon solubilities in water, but are still relatively insoluble. Because there is no reservoir of these hydrocarbons in the atmosphere, they evaporate from the water column into the atmosphere (McAuliffe, 1974). The rate of evaporation of soluble hydrocarbons from oil greatly exceeds the rate of their solution into water (McAuliffe et al, 1975; Harrison et al, 1975).

Biodegradation

Biodegradation rates in cold waters are slower than in warmer waters. However, we believe that the rate of biodegradation set forth in the draft Environmental Impact Statement is understated, because it is based upon the reduction in rate which occurs in chemical reactions (i.e., rate reduced one-half for each 10°C lowering of temperature). In preparing the final EIS, the BLM may wish to consider the following material. Slide 7 shows studies which have been conducted using Prudhoe Bay crude oil in Prudhoe Bay waters. Atlas (1973) found that in three days the percentage degradation at 5°C was 21% whereas at 25°C it was 39%. Atlas tested a 20°C temperature difference, but the rate of biodegradation at 5°C was less than one-half the rate at 25°C. In five weeks, 60% of the oil was lost and when Atlas added

nitrogren and phosphorous as nutrients to the water, 80% of the oil biodegraded in five weeks. ZoBell (1973) using Prudhoe Bay crude oil found 61% biodegradation in ten weeks even with the water at -1.1°C (below freezing).

The information just discussed suggests that the half-life of a crude oil spill in the Gulf of Alaska would be of the order of one day and with complete loss of oil from the surface by five days. Thus, any appreciable stranding of oil would not occur in a period exceeding three days, and the slick life might be less.

The draft Environmental Statement discusses oil spill trajectories in the northern Gulf of Alaska and recognizes in its initial statement dispersion, weathering, and biodegradation processes. However, it then discusses proposed trajectories and continues to give probabilities of stranding for long periods of time, up to 88 days for average times and no limit for maximum times. Slide 8 shows the approximate location of the Sites 3 and 4 estimated from figures in the CEQ report and the draft EIS. Site 3 is about 20 miles from shore. Site 4 is 60 miles from Montague Island and a similar distance from the Copper River Delta. At the bottom of the figure are listed the minimum and average times in days for oil to strand from these sites as calculated in the CEQ report. Only in the winter and fall at Site 3 is there an indication of oil stranding after a minimum three day period; the average times are very much longer.

Based upon the weathering and dispersion of the oil which we have previously discussed, there is little likelihood of significant quantities of oil from even a major spill stranding on the coastline

from these representative sites in the two major proposed lease areas.

Also shown on Slide 8 is a possible location for a "worst case" situation postulated in the draft EIS - a 100,000 bbl spill over 61 days 4 miles from shore with the oil driven continually ashore by wind. Until oil in commercial quantities has been discovered, possible spill locations and oil spill trajectories are only conjecture.

The use of meterological and oceanographic data is helpful in predicting oil spill trajectories. The Gulf of Alaska Operator's Committee is calculating spill trajectories from a number of sites throughout the lease area based upon past meteorological information. The Operator's Committee also is currently obtaining additional meteorological and oceanographic information from which spill trajectory calculations can be made. These data will be incorporated into oil spill contingency plans.

There are certain areas which are more subject to impact than others. For example, oil discharged within three or four miles of shore is likely to strand. Water currents (geostrophic) are consistently to the west, and winds are predominately from the east and southeast. The probability of oil coming ashore east of a possible spill location is very remote. In the eastern portion of the lease area a spill close to shore or to Kayak Island would likely strand.

The western lease area, however, is sufficiently far from shore that it is unlikely appreciable quantities of oil would strand. If oil did strand, it would probably do so on Montague Island or on Middleton Island.

RISK ANALYSIS

The draft EIS undertakes a "Proximity Evaluation and Summary Risk Analysis" which recognizes the dispersion and weathering of spilled oil, but does not compensate for them. The analysis uses the shortest distance to shore or environmentally sensitive areas from each lease tract, and the movement of oil at a constant speed of 0.4 mile per hour. The analysis also does not consider current and wind directions or velocities. The evaluation concludes that 100 blocks have a high potential risk for three types of impacts, 168 for two impacts, 56 for one impact, and that only six blocks would not have an environmental impact. These six tracts are located closest to the Copper River Delta.

In preparing the final EIS, the BLM should consider the weathering and dispersion of oil that we have discussed in this statement and referenced in the scientific literature, and to use spill trajectories suggested by meterological and oceanographic data to obtain a more meaningful analysis of possible adverse environmental impacts from a possible oil spill from each lease tract. The BLM might also consider the use of dispersants to minimize possible adverse effects in their risk analysis.

ADVANTAGES OF USING DISPERSANTS

Major crude oil spills have had documented adverse environmental effects only if oil stranded in the intertidal zone, or to birds if they were present at the time of the spill. Thus, methods of

minimizing oil adherence to feathers or preventing the stranding of oil ashore would be beneficial. Emulsification of the oil is such a method. I have already discussed the use of dispersants during the Chevron Gulf Coast spill and the demonstrated lack of adverse effects on the marine environment.

The use of oil dispersants received adverse publicity at the time of the Torrey Canyon spill. However, the dispersants and their formulation in toxic solvents as well as improper use in the intertidal zone, resulted in the adverse environmental effects; the intertidal zones have subsequently recovered. This adverse publicity resulted in the U.S. Environmental Protection Agency banning the use of dispersants in this country other than for safety reasons. Other countries and scientists in other countries recognized the advantageous use of surfactants, and dispersants are used to disperse oil (Marine Pollution Bulletin, 1975; Canevari, 1969, 1971, 1973, 1975; McAuliffe et al, 1975).

Slide 9 documents some of the advantages of using dispersants. First and foremost is the rapid dilution which occurs with emulsification. The dispersed oil mixes downward in near surface water and removes oil from the water's surface. The bulk of the oil is removed from most of the wind's influence and the oil does not travel as far as a surface slick (Chevron spill, 1 mile vs 6-9 miles average distances). The life of the surface oil slick would be reduced and significant amounts of oil are not likely to reach shore or move to biologically sensitive areas after one day.

Emulsification greatly lessens the tendency of oil to stick to itself and to solid surfaces. It, therefore, would lessen bird kill, although not eliminate it because not all oil can be emulsified and some remains on the surface. It would reduce the tendency of oil to adhere to solid particles (silt) in the water and therefore lessen the amount of oil that would sediment (Canevari, 1971; McAuliffe, 1973). It would particularly lessen the sedimentation of oil if the situation existed where surface oil met turbid water from the mouth of a river for example. Without emulsification, the oil might sink and be concentrated in the sediments at the zone where the oil met the turbid water.

If emulsified oil should strand in the intertidal zone, it would have very much less tendency to adhere to sand, rocks, or other solid surfaces. Emulsified oil would be in low concentrations and eliminate smothering of marine life in the intertidal zone which may occur with non-dispersed crude oil which has lost light components at sea. The emulsion would have a tendency to wash back out with receding tide and subsequent tides.

Emulsification would accelerate biodegradation by presenting a larger surface area to volume of oil. It likewise would accelerate physical weathering such as evaporation and solution with those soluble constituents dissolved in the water column subsequently either biodegrading or evaporating into the atmosphere.

Emulsification might also increase oil oxidation by exposing more of the oil's surface to the sun relative to the volume of oil even through the oil is removed from the immediate water surface. Emulsified oil stays principally in near-surface waters as documented during the Chevron oil spill.

SUMMARY

In summary, we believe that the probability of a major oil spill in the proposed lease area is very low, and that the odds may be more favorable than past experience, because of improved drilling practices and fail-safe well control valves.

We have documented what happened to oil discharged during the Chevron Gulf of Mexico spill, and showed that there was no measureable effect on marine life.

We believe that results from the Gulf Coast spill can be used to predict what would happen to oil from a possible spill in the northern Gulf of Alaska.

We believe that dispersing spilled oil has many advantages.

We believe that considering changes that occur when oil is discharged to the water surface, the use of meteorological and oceanographic data is a general way to predict spill trajectories, and the use of dispersants, will greatly reduce the number of tracts from which a spill is predicted to have observed environmental impacts as summarized in the draft EIS.

It is our belief that exploration, production, and transportation of crude oil, if found, can be conducted in the northern Gulf of Alaska without significant adverse environmental impacts.

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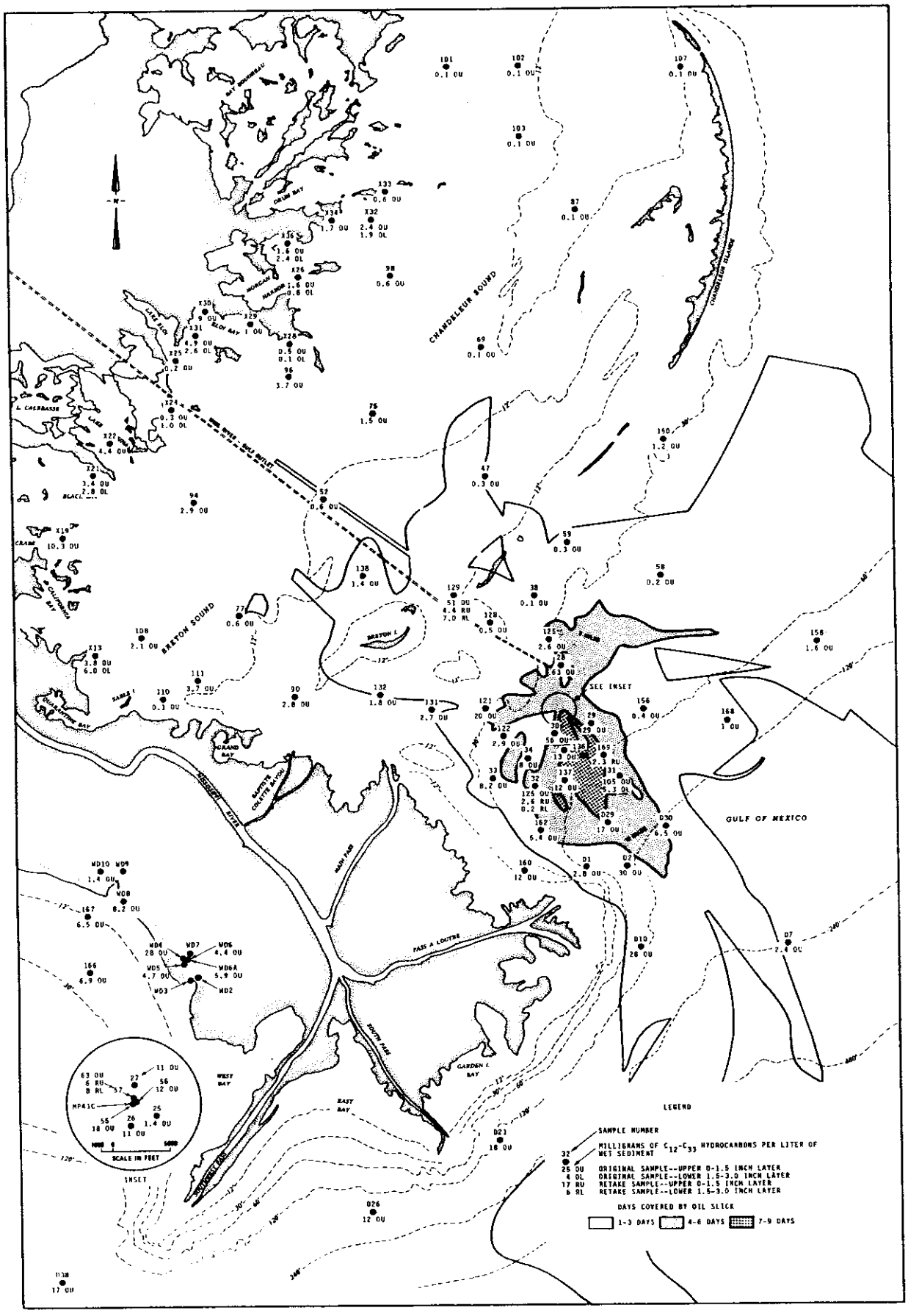
SLIDE 1

SOME GENERAL OBSERVATIONS CONCERNING OFFSHORE CRUDE OIL SPILLS

- THE PROBABILITY OF A MAJOR OIL SPILL IS LOW—ONLY 3 MAJOR SPILLS IN U.S. OFFSHORE WATERS.
- THE AMOUNT OF OIL LIKELY TO BE SPILLED – 20,000 TO 100,000 BARRELS.
- LENGTH OF SPILL – SEVERAL WEEKS TO SEVERAL MONTHS.
- HIGHEST CONCENTRATION OF CRUDE OIL WILL BE AT POINT OF SPILL.
- AMOUNT OF OIL FROM MAJOR OFFSHORE PLATFORM SPILLS HAS BEEN LESS THAN 2% OF TOTAL PETROLEUM INPUT.
- STUDIES OF MAJOR CRUDE OIL SPILLS HAVE DOCUMENTED ADVERSE EFFECTS ONLY ON SOME SPECIES OF INTERTIDAL ORGANISMS, AND TO BIRDS.
- OIL DISCHARGED TO THE MARINE ENVIRONMENT UNDERGOES A NUMBER OF PHYSICAL, CHEMICAL, AND BIOLOGICAL CHANGES.

SLIDE 2


CHANDELEUR SOUND
BRETON SOUND
GULF OF MEXICO
SEE INSET
INSET
SCALE IN FEET
LEGEND
SAMPLE NUMBER
MILLIGRAMS OF C_{12}-C_{33} HYDROCARBONS PER LITER OF WET SEDIMENT
25 OU ORIGINAL SAMPLE--UPPER 0-1.5 INCH LAYER
4 OL ORIGINAL SAMPLE--LOWER 1.5-3.0 INCH LAYER
17 RU RETAKE SAMPLE--UPPER 0-1.5 INCH LAYER
6 RL RETAKE SAMPLE--LOWER 1.5-3.0 INCH LAYER
DAYS COVERED BY OIL SLICK
1-3 DAYS
4-6 DAYS
7-9 DAYS

SLIDE 3

FATE OF DISCHARGED OIL

EVAPORATED 25–30% DURING FIRST 24 HOURS

RECOVERED 10–20% SKIMMED FROM WATER SURFACE

DISSOLVED IN WATER 0.15% IN 2 HOURS, ESTIMATED LESS THAN 1% IN 24 HOURS.

HIGHEST CONCENTRATION AT PLATFORM RANGED FROM 0.02 TO 0.2 ppm, DECREASING TO 0.002 ppm AT APPROXIMATELY 1 MILE.

SLIDE 4

FATE OF DISCHARGED OIL

EMULSIFIED IN WATER (OIL–IN–WATER EMULSION) 10–50%

HIGHEST CONCENTRATION OBSERVED ON 3 DAYS AT PLATFORM RANGED FROM 2 TO 60 ppm DECREASING TO 1 ppm AT 1 MILE.

SEDIMENTED LESS THAN 1% WAS FOUND IN BOTTOM SEDIMENTS WITHIN A 5 MILE RADIUS OF THE PLATFORM.

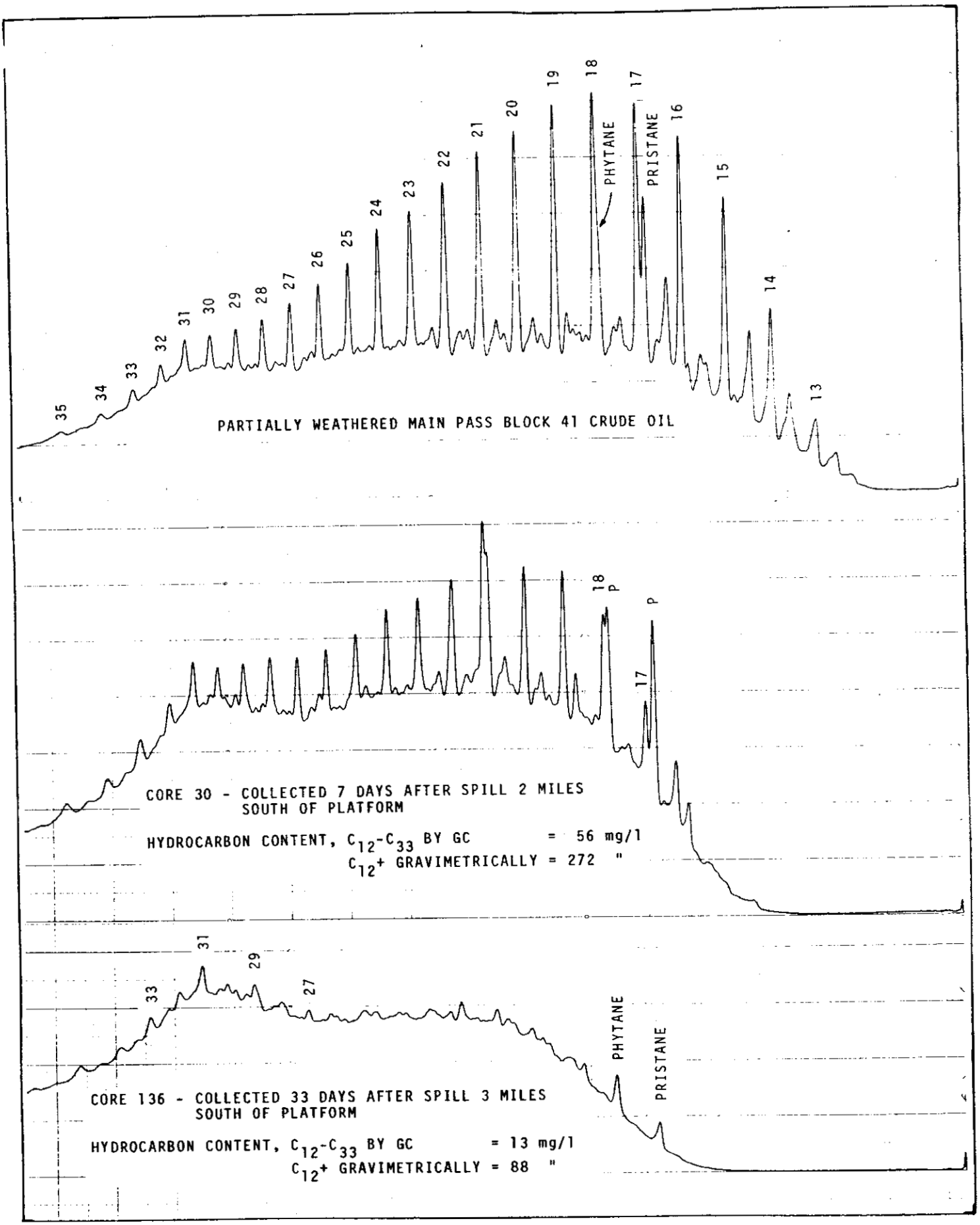
CONCENTRATIONS:

C_{12}–C_{33} FRACTION – HIGHEST, 125 mg/l; MEAN 31 mg/l

C_{12} PLUS FRACTION – HIGHEST, 624 mg/l; MEAN 151 mg/l

DISCHARGED OIL IN SEDIMENTS WAS RESTRICTED TO UPPER 1.5 INCHES

SLIDE 5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PHYTANE
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PRISTANE
16
15
14
13
PARTIALLY WEATHERED MAIN PASS BLOCK 41 CRUDE OIL
18 P
17
P
CORE 30 - COLLECTED 7 DAYS AFTER SPILL 2 MILES SOUTH OF PLATFORM
HYDROCARBON CONTENT, C_{12}-C_{33} BY GC = 56 mg/l
C_{12}+ GRAVIMETRICALLY = 272 "
31
29
33
27
PHYTANE
PRISTANE
CORE 136 - COLLECTED 33 DAYS AFTER SPILL 3 MILES SOUTH OF PLATFORM
HYDROCARBON CONTENT, C_{12}-C_{33} BY GC = 13 mg/l
C_{12}+ GRAVIMETRICALLY = 88 "

SLIDE 6

ADDITIONAL EVIDENCE OF WEATHERING

C_{12}–C_{33} HYDROCARBON FRACTION IN SEDIMENTS (CONCENTRATIONS IN mg/l)

AFTER SPILL	11 MONTHS LATER
125	2.5
63	6
51	4
	APPROXIMATELY BACKGROUND VALUES

LE 75–0774

SLIDE 7

CRUDE OIL BIOGRADATION

CRUDE OIL BIODEGRADATION RATES ARE APPRECIABLE AT ARCTIC TEMPERATURES, BUT NOT AS RAPID AS IN WARM WATERS.

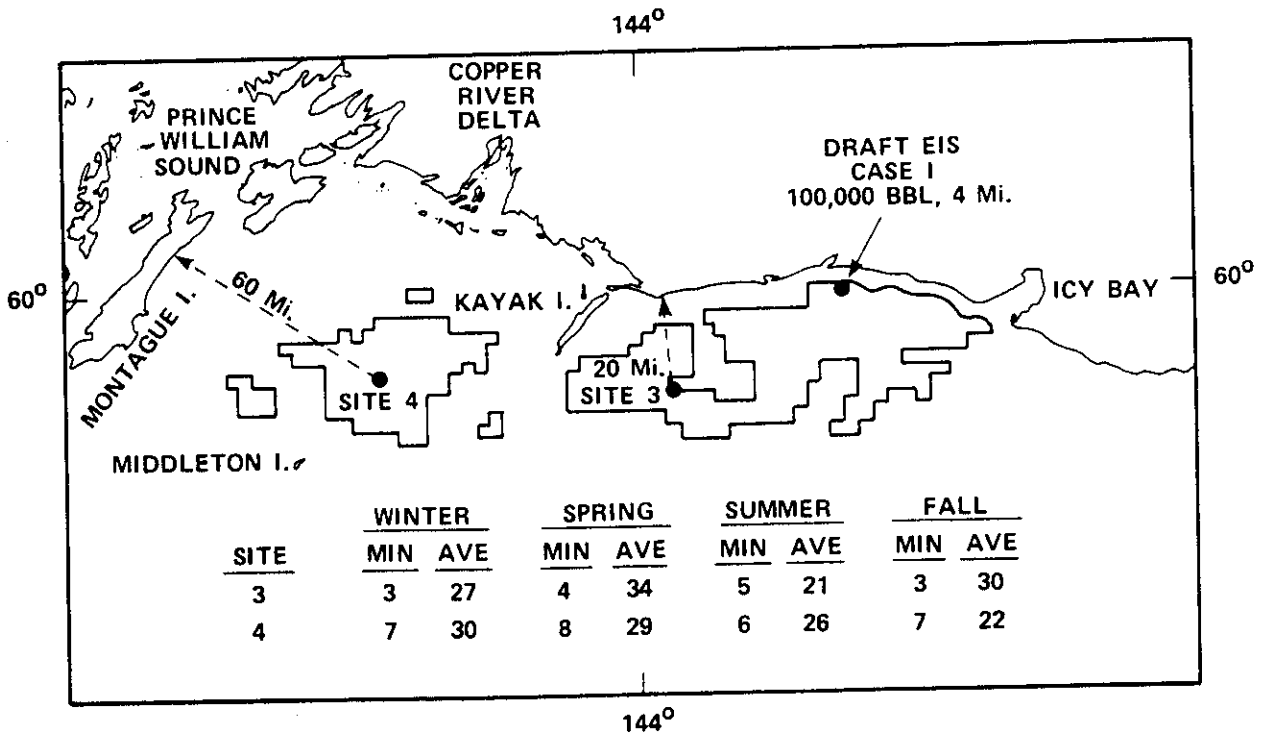
ATLAS FOUND THE FOLLOWING BIODEGRADATION RATES IN 3 DAYS FOR PRUDHOE BAY CRUDE OIL IN PRUDHOE BAY WATER.

5°C	21%
25°C	39%

IN 5 WEEKS 60% OF THE OIL WAS LOST. WITH NITROGEN AND PHOSPHORUS ADDED TO THE WATER, 80%.

ZOBELL FOUND 61% BIODEGRADATION IN 10 WEEKS AT −1.1°C.

SLIDE 8



	WINTER		SPRING		SUMMER		FALL	
SITE	MIN	AVE	MIN	AVE	MIN	AVE	MIN	AVE
3	3	27	4	34	5	21	3	30
4	7	30	8	29	6	26	7	22

LE 75–2859

SLIDE 9

ADVANTAGES OF USING DISPERSANTS (SURFACTANTS)

- RAPID DILUTION
- GREATLY REDUCES TENDENCY OF OIL TO "STICK" TO SOLID SURFACES
  - REDUCE BIRD KILL
  - REDUCE SEDIMENTATION
  - REDUCE AMOUNT OF OIL IN INTERTIDAL ZONE
- ACCELERATE BIODEGRADATION
- ACCELERATE PHOTO–OXIDATION
- ACCELERATE PHYSICAL WEATHERING
  - EVAPORATION
  - SOLUTION AND SUBSEQUENT EVAPORATION

BIOGRAPHICAL SKETCH

Clayton McAuliffe was born August 18, 1918, in Chappell, Nebraska. He received an A.B. degree in chemistry with high distinction from Nebraska Wesleyan University in 1941. He was a Frasch Foundation Fellow at the University of Minnesota where he obtained his M.S. degree in 1942. He was a Research Fellow at Cornell University, 1942-43 and 1946-48, and obtained his Ph.D. degree in soil science in 1948.

He was a Laboratory Assistant in inorganic chemistry 1939-40 and organic chemistry 1940-41 at Nebraska Wesleyan University. He was on the Manhattan Project as a Research Chemist with the Division of War Research, Columbia University, 1943-44, and with Union Carbide at Columbia and Oak Ridge, Tennessee, 1944-46. He was a consultant with the U. S. Department of Agriculture 1947-48, Research Associate at Cornell University 1948-50, and Research Associate Professor at North Carolina State University 1950-56. Since 1956 he has been with Chevron Oil Field Research Company, La Habra, California, where he is Senior Research Associate.

He has published 40+ papers in scientific journals on subjects such as petroleum in the marine environment, improving fluid flow through porous media to improve oil recovery, solubility of hydrocarbons in water, geochemistry in petroleum exploration, soil chemistry, radioisotopes and stable isotopes in soil-plant investigations, and stable isotopes in surface area measurements. He holds 20+ United States and foreign patents.

He is a member of the American Chemical Society, Society of Petroleum Engineers of AIME, American Society of Agronomy, Soil Science Society of America, and the American Association for the Advancement of Science. He is a member of Phi Kappa Phi, Sigma Xi, and Alpha Gamma Rho.

He is a Fellow of the American Association for the Advancement of Science and was Visiting Scientist Lecturer for the Soil Science Society of America, 1964-1967.

U. S. DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

HEARING ON PROPOSED LEASING IN THE GULF OF ALASKA

Ladies and Gentlemen:

I am Joe W. Tyson, Senior Scientist for the Gulf Universities Research Consortium (GURC), now Houston, Texas. I am appearing today on behalf of GURC at the request of the Gulf of Alaska Operators Committee.

As some of you may know, GURC is a research oriented organization which counts in its membership 20 universities with interests in the Gulf of Mexico.

During 1972-1974, GURC, at the request of a number of companies, initiated its Offshore Ecology Investigation to answer the deceptively simple question; "what is the measureable impact of drilling for oil, and later producing it on the estuarine and marine environment of the Louisiana outer continental shelf, the nation's greatest offshore oil producing region?" After an intensive study costing more than 1½ million dollars, the conclusion reached by GURC is that the drilling and subsequent production of petroleum products off of Louisiana has had no major lasting adverse affects on the marine environment and may even have been beneficial to some life forms. SLIDE #

In appearing here today, I fully realize that the Gulf

of Mexico is not the Gulf of Alaska, and that there are significant differences between the two areas. Nonetheless, we believe that the results of our studies must be given serious consideration whenever offshore leasing is proposed. This is because the GURC offshore oil investigation is by all odds the most thorough and comprehensive study of the environmental effects of offshore drilling and production yet undertaken.

Based upon the data analyses thus far, several general conclusions can be reached from this comprehensive Offshore Ecology Investigation:

1. It questions the universal necessity for conducting a "before-the-fact" baseline study to subsequently determine the environmental impact of this type of man's activity.
2. Natural phenomena such as seasonality, floods, upwellings, and turbid layers have much greater impact upon the ecosystem than do petroleum drilling and production activities.
3. Concentrations of all compounds of OEI interest which are in any way related to drilling or production are sufficiently low to present no known persistent biological hazards.
4. Every indication of good ecological health is present. The region of the sampling sites is

a highly productive one from the biological standpoint, more so than other regions thus far studied in the eastern and open Gulf of Mexico.

5. Timbalier Bay has not undergone significant ecological change as a result of petroleum drilling and production since just prior to 1952 when other more limited data was generated.

The accuracy of the conclusions reached on any such scientific study are, of course, dependent upon the validity of the procedures and the accuracy of various tests and measurements. Therefore, the procedures and equipment used in this study will be discussed in some detail in this presentation along with the most important of the factual data and results.

The biological, chemical and physical experiments to be performed were designated and sites were selected in Timbalier Bay, Louisiana, and in the offshore area to depths of about one hundred feet of water (shaded in red). Sampling stations adjacent to drilling or production platforms and control sample stations in areas where there has never been oil drilling or production are within the same region, thus making possible valid comparative studies. All sampling stations are located far enough from the Mississippi River mouth to uniformly minimize, but not eliminate, its impact.

SLIDE #6

SLIDE #7

A low elevation aerial oblique view of the region shows

the natural relationships between the Continental Shelf, the narrow beach, and the inner bay. SLIDE #8

Platforms, both for drilling and production, are quite dense in this region between Timbalier Island and Casse-tete Island. SLIDE #

This platform just west of Philo Brice Island in Timbalier Bay was one of the intensive sampling sites with sample stations being located in a radial pattern outward from the platform. SLIDE #

The density of platforms and wells offshore is somewhat less, than in the bay, although recent figures indicate there are some 2,650 platforms in the northern Gulf of Mexico. Because of the intensity of petroleum presence and production, there has been and is oil in this environment -- whether as a result of natural seeps, spills, or whether as a result of overboard discharge of brine containing a few parts per million of petroleum hydrocarbons or from other sources as city wastes, seagoing ships, sports boats, and the plants and animals living in the environment. SLIDE #1

A working platform makes many contributions to the environment in addition to its physical presence. You will note that among the potential contributions from the platform are nutrient (food) materials from treated sewage, garbage, brine containing small amounts of petroleum hydrocarbons, trace elements from corrosion protection devices, and other kinds of SLIDE #1

compounds as well as a habitat for plants and animals. The sampling program was designed to determine which of those are present and, if present, their locations and concentrations.

GURC scientists visited the platform and control sta- SLIDE # tions as indicated by this sample station map. Timbalier Bay had 224 stations, enough to allow any existing gradients to be established. There were 115 stations offshore and along transects or lines drawn from the platform and control sites to shore-based stations. All field equipment was regularly calibrated against available appropriate standards (both external and internal) to allow comparative correlations to be made from one field trip to the next. There were four seasonal 8-to-10-day trips each year for the two years by the group plus many other shorter trips by individual scientists. All of the sampling stations were occupied on each seasonal trip, as well as at other times by either the 23 scientists or some of the more than 30 graduate students involved in the program -- many of whom were diving scientists.

The largest number and volumes of samples collected SLIDE # were water samples taken at the surface, at mid-depths and very near bottom to determine oceanographic information such as salinity, temperature and nutrient and trace element chemistry. Fractions were analyzed for total carbon and organic carbon. For these kinds of analyses, relatively

small volumes of water are required; allowing utilization of the Sampling Bottle shown.

Large volume samples were required for the determination of the specific classes of hydrocarbons in the water mass. Therefore, this large volume sampler was used so enough water would be acquired to permit the detection and characterization of hydrocarbons. SLIDE #

Plankton nets were used in order that the mainly microscopic floating plant and animal life could be caught and studied. From samples captured by the Plankton nets the scientists were able to determine, as a function of carefully measured volume, the nature of the living things floating in the water, their diversity, their effective weight by species, and their hydrocarbon types and amounts. SLIDE #

The bottom grab sampler takes approximately 1/3 of a cubic yard of sediment each time it is lowered. These sediment samples were required for sediment analysis and to catch the bottom dwelling plants and animals (benthos). Some bottom grab samples as well as short sediment cores were collected by divers. SLIDE #2

Evidences of drill cuttings and muds were sought at every sampling station and were found by divers only once and in very small quantities near a platform leg. These cuttings could not be associated with an adverse impact. SLIDE #2

It was mentioned earlier that water samples were taken SLIDE #2

to allow for the determination of dissolved mineral nutrients. Nutrients enter the living processes in plants and animals and are, therefore, often early affected by materials introduced into the environment. The extent of dissolved mineral nutrients then is an indicator of environmental impact. Here, onboard scientists at the sampling station are splitting the water samples for chemical analysis.

Crude oil will float temporarily at the surface, form- SLIDE #2
ing a filmy sheen. To determine the quantities and fate of these petroleum hydrocarbons, it was necessary to sample the thin floating film. Project scientists developed this sampler that would allow them to take a reproducible standard sample and relate the results of chemical analyses to the volume and area that had been sampled.

The sampler was lifted aboard the research vessel where SLIDE #
the adsorbed oil and other materials were carefully washed into previously cleaned containers. Scrupulous care was taken to insure that no contaminants (such as lubricating oils)get into the sample during the transfer process.

In university laboratories, the biological samples were positively identified, counted and weighed so that compari- SLIDE #2
sons were possible from place to place on a seasonal basis.

Some of the laboratory activities required highly so- SLIDE #2
phisticated and massive equipment such as these views of hydrocarbon chemistry laboratories and gas chromatograph and

mass spectrometer equipment linked to computers. Such a link makes comparisons possible between samples collected during the project and calibrated standards and permits identification of separate compounds present. Furthermore, selected animals and some uppermost sediment samples were analyzed to determine their hydrocarbon content.

That active oil drilling and production operations do SLIDE # sometimes result in release of hydrocarbons is demonstrated by this infrared image showing drilling platforms and a temporary hydrocarbon sheen resulting from their activities. In the center of the view, a one molecule-thick layer of crude oil shows as a lighter blue area stretching between the two rigs. The reddish areas that you see below are marsh grasses onshore nearby as they appear on infrared film.

The occurrence of other fresh crude oil on the surface SLIDE #: of the water gave the scientists an opportunity to conduct field studies on its behavior and fate in the marine environment, so this small floating patch was observed for several days.

After twenty-four hours, the appearance of the same oil had changed. Evaporation of some less complex hydrocarbons SLIDE #: and microbial and chemical degradation of the oil was relatively advanced. It will be noted that the oil has begun to emulsify and clump.

In order to follow the process and rate of breakdown of the oil under more controlled conditions, experiments were SLIDE #:

conducted in the laboratory. Flasks were inoculated with both locally produced oil and bacteria found in the area. Here on the left, you will note that initially the oil is floating on the surface of the seawater with very few globules and very little clumping. On the right, 24 hours later, bacterial and chemical action has substantially degraded the crude oil; clumping is very far advanced; and much of the material has been converted by bacteria into foodstuffs and byproducts.

In order to better identify and count these bacteria, SLIDE #: seawater was placed on suitable materials in shallow plastic dishes using standard microbiological techniques. Here, particularly under the number 14, you see several small, white, glistening colonies of individual kinds of hydrocarbon-degrading bacteria isolated from the study area, and, in the same numbers, from other control areas in the Gulf of Mexico.

These experiments indicate that physical and bacterial processes rapidly degrade oil films with the result that there are extremely low amounts of hydrocarbons (average: 5 parts per billion) found in the water.

There was a definite lack of concentration or build-up of any specific hydrocarbon molecule. Similar results were shown by mass spectrometer analysis of the oil on the surface of the water and samples taken deeper in the water.

The major components of the Gulf of Mexico ecosystem SLIDE #1 are the phytoplankton, the mainly microscopic floating plants.

These are the primary producers of the sea that convert carbon dioxide, minerals, and water to starches and sugars, protoplasm and other chemical compounds by photosynthesis. They are eaten by the next level in the food web, the zooplankton which include numerous types of mainly microscopic animals The nekton are those free-swimming animals fonnd in the environment such as fish and squid. The benthos are the bottom dwellers, some attached and some capable of burrowing in the sediments.

Several aspects of the food cycle and ecosystem were studied in the Offshore Ecology Investigation. Some of the aspects studied were the total mass and diversity of living material present and the distributions of living plants and animals. The results of these investigations showed that there are no differences solely attributable to geographical location except for populations living on platform legs. In other words, except for increase in the populations of certain life forms, the presence of man and petroleum production has had no major effect on the total mass and diversity of living material. Because all life forms are sensitive to their environment, the seasonal changes in both temperature and chemical nature were studied in detail. By the end of the study, the project biologists were able to show that these seasonal variations were far more significant than any other variations, including proximity to oil producing areas.

One sensitive measure of the gross productivity of the SLIDE #3
phytoplankton community is the presence and amount of chlorophyll, the green substance of plants which allows conversion of simple compounds into complex food materials. It can be seen on the slide that there were significant seasonal changes in chlorophyll content reflecting the total populations of floating microscopic plants.

Associated with changes in this floating plant commu- SLIDE #3
nity were seasonal changes in the floating animal community, the zooplankton. It can be seen that these seasonal changes follow the seasonal change in chlorophyll.

The bottom dwelling community is of great import in SLIDE #3
the ecosystem. It is this community that receives the "rain" of food that sinks down from above. Many of the benthos are filter feeders that therefore take surrounding water through their bodies and remove particulate matter and phytoplankton from the water as food. Others obtain nutrients from sediment passed through the digestive tract. It will be noted that the seasonal changes in this community greatly exceeded the differences between a site of man's activity and a control site where there was no such activity.

Because the reef effect of platforms is so important, SLIDE #4
the study of the living things found on their legs deserves further attention. Every solid surface is colonized and becomes a reef. Platform legs here supported about 6½ pounds

of living things per square yard of surface area, more than any natural "surface" in the study area.

As one begins at the surface of the water and goes downward to the bottom of a platform leg, the simplest of plants, the algae, which are also near the bottom of the food web, grow only in shallower depths where light can penetrate. The net effect of the growth on platform legs is to increase the available food supply for animals higher in the food web because these plant materials are graced by smaller fish, snails and other animals which are fed upon, in turn, by the species sought by man. SLIDE #4

To investigate growth rates, the platform leg on the left, had been scraped to the bare metal some 45 days before the photograph was made. It is easily seen that recolonization is rapid. On the right, the large white patch is a colonial animal form called Bryzoa. SLIDE #4

Here, both barnacles and hydroids (other animal forms) are seen growing together. As colonization develops with time, there is both an increase in and a complexity of living things as well as an increasing competition for the available space. The hydroids are overgrowing the barnacles. SLIDE #4

From the fish catch, shrimp catch, and oyster harvest data shown plotted here with oil production through the years in this region of Louisiana, it can be seen that these catches of commercial importance have not decreased as oil production SLIDE #4

has increased; they have indeed increased. This is not to say that increase in catch is the result of industrial activity; however, it is certain that catches have not suffered while oil drilling and production have increased greatly during the same years.

"In conclusion, ladies and gentlemen, let me state that SLIDE #4 I appreciate the opportunity to appear before you today to report on the results of our Offshore Ecology Investigation. Based on this study and other less inclusive with which I am familiar, it appears that there are no significant long-term advsrse effects resulting from offshore petroleum operation. In light of this evidence, and considering the critical need for the energy resources of the Gulf of Alaska, all factors appear to argue in favor of the holding of the proposed sale.

Joe W. Tyson
SENIOR SCIENTIST
GULF UNIVERSITIES RESEARCH CONSORTIUM