SCOMM
79:25

HOUSE COMMITTEE REPORT

(7)

Date Referred: April 2, 1991 FURTHER REFERRALS: Resources

Date of Committee Action: _____

The HOUSE SPECIAL COMMITTEE ON OIL AND GAS Committee considered: HJR 36

HOUSE JOINT RESOLUTION NO. 36 OFFSHORE LEASES/SPILL CONTINGENCY PLANS

Relating to off-shore oil exploration, development, and tanker transportation activities in the Beaufort and Chukchi seas.

RECOMMENDATIONS:
be replaced with CS HJR 36 [X] the same title
[ ] a new title

[ ] have attached amendments(s)
[ ] do pass
[ ] do not pass
[ ] no recommendations
[X] individual recommendations
[ ] additional referral to the _____ Committee

ADOPTS: _____ letter of Intent

ATTACHES NEW FISCAL NOTE(s): (Dept)

[ ] fiscal impact _____

[ ] zero fiscal note _____

APPROVES PREVIOUS: (Dept/Date)

[ ] fiscal note(s) _____

[ ] zero fiscal note(s) _____

SIGNING DO PASS	DP	OTHER RECOMMENDATIONS	DNP	NR	AM
[redacted]	'	[redacted]		✓	
[redacted]	✓	[redacted]	X		✓
Bill Hudson	✓	[redacted]		✓	
		[redacted]		✓	
		Gail Phillips	X		

Bill Hudson
CHAIRMAN'S SIGNATURE

FISCAL NOTE

STATE OF ALASKA
1991 LEGISLATIVE SESSION

BILL NO. HJR 36

Revision Date:
Department Affected: Natural Resources
Title: Off Shore Oil Exploration Development & Transportation
BRU: Petroleum Management
Components:
Sponsor: Rep. Maclean, Rep. Hudson
Requestor: House Oil & Gas Committee
COMPONENT SERIAL NO.

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND&STRUCTURES						
GRANTS,CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	0.0	0.0	0.0	0.0	0.0	0.0
CAPITAL						
REVENUE	*	*	*	*	*	*

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

Estimate of Current year impact:

ANALYSIS: (Attach a separate page if necessary)

* If this Resolution is enacted, it could directly affect state oil and gas leasing policy and revenues.

Prepared by: Carol Wilson
Phone: 465-2400
Division: Commissioner's Office
Date: 11-Apr-91

Approved by Commissioner: Harold Heinze HC Heinz
Date: 11-Apr-91
Agency: Department of Natural Resources

Distribution (by preparer) : Legislative Finance, legislative Sponsor, Requestor, OMB, & Impacted Agency(ies).

REV 10/90

ALASKA STATE LEGISLATURE

Representative Eileen Panigeo MacLean
Co-Chair House Finance Committee
P.O. Box 830
Barrow, Alaska 99723

WHILE IN JUNEAU
Box V
Juneau, Alaska 99811
465-4525
465-4833

HOUSE OF REPRESENTATIVES

District 22

North Slope Borough

Anaktuvuk Pass
Atqasuk
Barrow
Kaktovik
Nuiqsut
Point Hope
Point Lay
Wainwright

Northwest Arctic Borough

Ambler
Buckland
Deering
Kiana
Kivalina
Kobuk
Kotzebue
Noatak
Noorvik
Selawik
Shungnak

MEMORANDUM

DATE: 4/3/91

TO: Representative Bill Hudson, Chair
Oil and Gas Committee

FROM: Representative Eileen P. MacLean, Co-Chair E.P.M.
House Finance Committee

RE: Request for Scheduling

I would like to request that HJR 36, regarding off-shore oil exploration, development, and tanker transportation activities in the Beaufort and Chukchi seas, be scheduled for a hearing in the Oil and Gas Committee as soon as possible.

While I support responsible onshore development of the Arctic National Wildlife Refuge, I am deeply concerned about offshore oil and gas activities, which could potentially decimate marine mammals and foul the environment, if a mishap were to occur.

As early as this summer, the Department of Interior proposes to conduct oil and gas lease sales of forty million acres of these waters, without the ability to adequately respond to, contain, or clean up a significant oil spill in arctic water under commonly occurring environmental conditions.

Congress has acknowledged that effective oil spill response options for remote arctic waters remain undemonstrated and therefore mandated preparation of an extensive report on a variety of issues relating to offshore oil spill contingency planning in the Arctic, with particular attention to be given to Native concerns.

The Resolution raises concern about the lease sales proceeding in the Arctic before the Congress, and the public have the opportunity to review the report.

The bill further encourages the Department of Interior to give the Beaufort and Chukchi seas the same scrutiny as waters in the lower 48 states, which were declared off limits to oil and gas leasing and development activities in June 1990.

If you have any questions regarding the resolution, please contact me or Deborah Driver, my Legislative Assistant.

Thank you very much for your Co-Sponsorship of the resolution.

ALASKA STATE LEGISLATURE

Representative Eileen Panigeo MacLean
Co-Chair House Finance Committee
P.O. Box 830
Barrow, Alaska 99723

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Juneau, Alaska 99811
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HOUSE OF REPRESENTATIVES

Disirict 22

North Slope Borough

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Shungnak

MEMORANDUM

DATE: 4/8/91

TO: Members of the Special Committee on Oil & Gas

FROM: Representative Eileen P. MacLean E.P.M.

SUBJ: HJR 36

The purpose of HJR 36 is to send a message to the U.S. Congress that the Alaska State Legislature is concerned about off-shore oil exploration, development, and tanker transportation activities in the arctic waters of the Beaufort and Chukchi seas. The resolution encourages on-shore oil development before such activity off-shore is considered

The Department of Interior expects to lease forty million acres of the Beaufort and Chukchi waters as early as the summer of 1991. The Interior's interest in these waters may be at least partly the result of having little new off-shore land to lease for oil development. Last year, President Bush put vast tracks off the coasts of California, Florida, New England, and the Northwest off-limits for up to 10 years.

The Cook Inlet and Prince William Sound spills evidence the oil industry's lack of capability to effectively respond to and clean-up an oil spill in warmer, ice-free waters. In the Arctic such industrial activity becomes even more precarious because of the extreme environmental conditions. Harsh storms occur without warning and the waters are frozen over for a good part of the year.

The findings of the Alaska Oil Spill Commission, the Arctic Research Commission, and the Mineral Management Service itself have determined that there exists no effective oil spill response options for remote Arctic waters. There are few methods except burning to recover oil from the sea.

As part of the 1990 Oil Pollution Act, Congress acknowledged that there is not sufficient data on off-shore oil activity and directed the Secretary of the Interior to develop an extensive report on a variety of issues relating to the impact of potential oil spills and seismic activity in the Arctic ocean, with particular attention to Native concerns. This report is expected to be released in May of 1991. Nevertheless, the lease sales are proceeding without review of the report's findings.

In addition, the resolution states support for development on the coastal plain of the Arctic National Wildlife Refuge (ANWR) on the basis that the oil industry is more capable of preventing and responding to a spill on-shore than in the ocean. On-shore development at Prudhoe Bay has demonstrated no significant impact on wildlife. In the event of a spill, material is concentrated on a section of the tundra, more easily manageable than in the ocean, where rapid wave action serves to spread the oil uncontrollably over a wider area.

Included in member's packets, there are several letters/resolutions of support from various organizations in my district, along with a letter addressed to the Department of Interior from NANA Regional Corporation that clarifies some of the concerns relating to off-shore oil development. Additionally, a copy of the outline for the report mandated by Congress is included for review.

I thank the committee members for their support.

COMMENTS FOR OIL AND GAS HEARING - 4/15

Mr. Chairman, members of the committee, thank you for taking the time to hear testimony on the issue of off-shore oil exploration, development, and tanker transportation operations in the Beaufort and Chukchi seas.

As you know, I'm Representative Eileen P. MacLean from district 22, comprising the North Slope and Northwest Arctic Boroughs. As stated previously during the last hearing on this bill, HJR 36 would convey to the U.S. Congress that the Alaska State Legislature has concerns about off-shore industrial activity in the waters of the Beaufort and Chukchi seas.

I would like committee members to understand that weather conditions of these Arctic waters are more severe than in waters elsewhere in Alaska and the lower 48. I'm confident that Mr. Walt Parker's testimony from Anchorage will lend credibility to this assertion.

Congress itself has acknowledged that there are differences between Arctic waters and warmer, ice-free waters elsewhere in Alaska and the continental United States. As part of the 1990 Oil Pollution Act, Congress

directed the Secretary of the Interior, in consultation with the Governor of Alaska, to develop an extensive report. The report will provide detail of existing environmental conditions in the Beaufort and Chukchi seas; Native concerns about the impact of industrial activity on marine mammals; existing oil spill measures in terms of the ability of the oil industry and the local coastal communities to launch organized, efficient response plans in the event of a spill; the feasibly of oil transportation of this hazardous material through these waters; existing oil spill response technologies to remove oil from the sea; and, monetary compensation to Natives for recovery of damages in the event that subsistence resources are decimated by an oil spill. Each member's folder includes an outline of this report.

The report is due to be completed the latter part of May, shortly before the Secretary of Interior is planning to hold lease sales of 40 million acres of these waters for oil exploration and development. I feel it is important for Congress, the oil industry, and the public to review this report before moving forward with the lease sales in the Beaufort and Chukchi seas.

These waters deserve the same scrutiny as the waters off the coasts of California, Florida, New England, and the Northwest, which the president recently declared

off-limits to oil development for the next 10 years. The people of the coastal communities in Alaska are no less important than those residing in the lower 48.

I commend the oil industry's successful long-standing on-shore oil development which has had minimal impact on the wildlife resources in the area. For this reason, I support on-shore development of the Arctic National Wildlife Refuge.

However, when we talk about any industrial activity off-shore, we must refer to the previous mishaps in Prince William Sound and Cook Inlet. We must never forget these disasters, because they provide a frame of reference to what could potentially happen again. If petroleum is discovered in the Beaufort and Chukchi seas, there will be a need to transport this material to market, possibly by way of tanker.

Industrial activity off-shore that precipitates an accident means the oil is going to end up in the water. It is more difficult to clean-up an oil spill in the water than an oil spill on the land - it's that simple. The spills of Prince William Sound and Cook Inlet revealed the oil industry's inability to launch organized, efficient response plans in the event of a spill off-shore. Response to, and clean-up of, a spill would be even more

exacerbated in Arctic waters, which ice over during a good part of the year and are subject to harsh storms that occur without warning. Further, we don't yet know the full extent of this activity's impact on marine mammals, especially bowhead whale migration on which my people - the Inupiat people - depend.

The state stands to profit little from off-shore exploration and development activity. I'm introducing this resolution in the state's best interest. I want to emphasize that I am not an ardent environmentalist, opposed to all development. Oil and gas development has been very good for the people of Alaska, even for residents of the North Slope, providing weatherized homes, electricity, decent education for the children, good medical care, and somewhat reliable sanitation facilities. But the people of Alaska will profit very little from off-shore industrial activity. All the leases in the Chukchi sea are federally owned, where the state has no claim to any of the royalty money or production taxes. Prudhoe Bay, by comparison, is on state land. ANWR is on federal land, but oil production there would be subject to state taxes because it's within state borders. In addition, the state could get between 50 and 90 percent of royalties on the oil produced. The state needs to encourage development of oil and gas on land that will benefit the people of Alaska.

I ask the committee's support for HJR 36, and would be happy to answer any questions members may have.

Thank you.

Replace lines 2-5, page 3

Further resolved that the Alaska legislature believes that the report mandated by the Congress in the Oil Pollution Act of 1990 should be reviewed and an environmental assessment of off-shore industrial operations in the Arctic be conducted, and should the findings of that report indicate harm to the delicate environment or the subsistence lifestyle of the people in the region, then all further exploration be put on hold until the people in the region are satisfied that exploration and development can continue in an environmentally sensitive manner; and be it

CS FOR HOUSE JOINT RESOLUTION NO. 36 (O&G)

IN THE LEGISLATURE OF THE STATE OF ALASKA

SEVENTEENTH LEGISLATURE - FIRST SESSION

BY THE HOUSE SPECIAL COMMITTEE ON OIL AND GAS

Offered:
Referred:

Sponsor(s): REPRESENTATIVES MACLEAN, Hudson, Jacko, Koponen, Donley, Finkelstein, Brown, Ivan, Kubina, Ulmer

A RESOLUTION

Relating to off-shore oil exploration, development, and tanker transportation activities in the Beaufort and Chukchi seas.

BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF ALASKA:

WHEREAS the state supports the prudent and orderly development of the state's oil and gas reserves in an environmentally sound manner; and

WHEREAS the state has been responsive to the nation's need to decrease its dependence on foreign oil; and

WHEREAS there is a high probability that the coastal plain of the Arctic National Wildlife Refuge contains economically recoverable oil reserves; and

WHEREAS the oil industry has demonstrated that properly regulated onshore oil and gas exploration, development, and transportation can occur in an environmentally sound manner; and

WHEREAS, following an expedited environmental assessment by the Outer Continental Shelf Task Force, the President announced in June 1990 the closure until the year 2000 of large outer continental shelf tracts off the coasts of California, Florida, New England, and the Northwest to oil and gas leasing and activities; and

WHEREAS the Outer Continental Shelf Task Force has not yet been asked by the President to

complete a similar environmental assessment for off-shore areas totalling some 40,000,000 acres in the Beaufort and Chukchi seas, which are scheduled for leasing by the federal government in 1991; and

WHEREAS Alaskan water, particularly arctic water, deserves the same, if not higher, scrutiny regarding the wisdom and environmental safety of oil and gas activities as was given to water offshore of the contiguous states; and

WHEREAS the Beaufort and Chukchi seas are among the world's most dynamic and relatively unspoiled wildlife habitats, containing critical feeding and breeding grounds, rest and brooding areas, and migratory corridors where a wide variety of marine mammal, bird, and fish species concentrate; and

WHEREAS the Inupiat people largely derive their nutritional needs and cultural identity through the traditional harvest of marine species, particularly the endangered bowhead whale and other marine mammals; and

WHEREAS the Chukchi and Beaufort seas are characterized by extreme weather conditions, including prolonged ice cover and darkness, frigid temperatures, high winds and waves, and low visibility; and

WHEREAS the Alaska Oil Spill Commission, the Arctic Research Commission, and the Minerals Management Service have each acknowledged that effective oil spill response options under certain arctic conditions for remote arctic waters remains undemonstrated; and

WHEREAS the Oil Pollution Act of 1990, P.L. 101-380, 104 Stat. 484, directed the Secretary of the Interior, in consultation with the Governor of Alaska, to prepare an extensive report on a variety of issues relating to offshore oil spill contingency planning in the Arctic, including compilations of known data relating to potentially affected wildlife resources; existing drilling and spill response technology; past, present, and proposed exploratory operations; and, specifically, Native Alaskan concerns; and

WHEREAS initial scientific data indicates that marine mammals and birds in the Arctic react to industrial noises, including noise from drilling, icebreaker, seismic activities, aircraft overflights and other vessel disturbances;

BE IT RESOLVED that the Alaska State Legislature believes that the oil industry has yet to conclusively demonstrate the ability to adequately respond to, contain, or clean up a significant oil spill in arctic water under commonly occurring environmental conditions; and be it

FURTHER RESOLVED that the Alaska State Legislature believes that lease sales in the Beaufort and Chukchi seas must be approached in an extremely cautious way with complete participation by the people residing in the affected areas who are the most knowledgeable about arctic conditions; and

be it

FURTHER RESOLVED that the Alaska Legislature believes that the report mandated by the Congress in the Oil Pollution Act of 1990 should be reviewed and an environmental assessment of offshore industrial operations in the Arctic be conducted; and be it

FURTHER RESOLVED that the Alaska State Legislature believes that more research is needed, and urges industry to continue to undertake that research, focusing on the unique and unpredictable conditions found in the Arctic, in terms of oil spill contingency plans and the effect of exploration and development in general as well as specific research to determine the effect of industrial noise on marine mammals and especially on the bowhead whale.

COPIES of this resolution shall be sent to the Honorable George Bush, President of the United States; to the Honorable Dan Quayle, Vice-President of the United States and President of the U.S. Senate; to the Honorable Robert C. Byrd, President Pro Tempore of the U. S. Senate; to the Honorable George J. Mitchell, Majority Leader of the U. S. Senate; to the Honorable Thomas S. Foley, Speaker of the U.S. House of Representatives; to the Honorable Manuel Lujan, Jr., Secretary of the Interior; to Barry Williamson, Director of the Minerals Management Service; and to the Honorable Ted Stevens and the Honorable Frank Murkowski, U.S. Senators, and the Honorable Don Young, U.S. Representative, members of the Alaska delegation in Congress.

7-LS1046\J
Chenoweth
4/23/91

CS FOR HOUSE JOINT RESOLUTION NO. 36 (O&G)

IN THE LEGISLATURE OF THE STATE OF ALASKA

SEVENTEENTH LEGISLATURE - FIRST SESSION

BY THE HOUSE SPECIAL COMMITTEE ON OIL AND GAS

Offered:
Referred:

Sponsor(s): REPRESENTATIVES MACLEAN, Hudson, Jacko, Koponen, Donley, Finkelstein, Brown, Ivan, Kubina, Ulmer

A RESOLUTION

Relating to off-shore oil exploration, development, and tanker transportation activities in the Beaufort and Chukchi seas.

BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF ALASKA:

WHEREAS the state supports the prudent and orderly development of the state's oil and gas reserves in an environmentally sound manner; and

WHEREAS the state has been responsive to the nation's need to decrease its dependence on foreign oil; and

WHEREAS there is a high probability that the coastal plain of the Arctic National Wildlife Refuge contains economically recoverable oil reserves; and

WHEREAS the oil industry has demonstrated that properly regulated onshore oil and gas exploration, development, and transportation can occur in an environmentally sound manner; and

WHEREAS, following an expedited environmental assessment by the Outer Continental Shelf Task Force, the President announced in June 1990 the closure until the year 2000 of large outer continental shelf tracts off the coasts of California, Florida, New England, and the Northwest to oil and gas leasing and activities; and

WHEREAS the Outer Continental Shelf Task Force has not yet been asked by the President to

complete a similar environmental assessment for off-shore areas totalling some 40,000,000 acres in the Beaufort and Chukchi seas, which are scheduled for leasing by the federal government in 1991; and

WHEREAS Alaskan water, particularly arctic water, deserves the same, if not higher, scrutiny regarding the wisdom and environmental safety of oil and gas activities as was given to water offshore of the contiguous states; and

WHEREAS the Beaufort and Chukchi seas are among the world's most dynamic and relatively unspoiled wildlife habitats, containing critical feeding and breeding grounds, rest and brooding areas, and migratory corridors where a wide variety of marine mammal, bird, and fish species concentrate; and

WHEREAS the Inupiat people largely derive their nutritional needs and cultural identity through the traditional harvest of marine species, particularly the endangered bowhead whale and other marine mammals; and

WHEREAS the Chukchi and Beaufort seas are characterized by extreme weather conditions, including prolonged ice cover and darkness, frigid temperatures, high winds and waves, and low visibility; and

WHEREAS the Alaska Oil Spill Commission, the Arctic Research Commission, and the Minerals Management Service have each acknowledged that effective oil spill response options under certain arctic conditions for remote arctic waters remains undemonstrated; and

WHEREAS the Oil Pollution Act of 1990, P.L. 101-380, 104 Stat. 484, directed the Secretary of the Interior, in consultation with the Governor of Alaska, to prepare an extensive report on a variety of issues relating to offshore oil spill contingency planning in the Arctic, including compilations of known data relating to potentially affected wildlife resources; existing drilling and spill response technology; past, present, and proposed exploratory operations; and, specifically, Native Alaskan concerns; and

WHEREAS initial scientific data indicates that marine mammals and birds in the Arctic react to industrial noises, including noise from drilling, icebreaker, seismic activities, aircraft overflights and other vessel disturbances;

BE IT RESOLVED that the Alaska State Legislature believes that the oil industry has yet to conclusively demonstrate the ability to adequately respond to, contain, or clean up a significant oil spill in arctic water under commonly occurring environmental conditions; and be it

FURTHER RESOLVED that the Alaska State Legislature believes that lease sales in the Beaufort and Chukchi seas must be approached in an extremely cautious way with complete participation by the people residing in the affected areas who are the most knowledgeable about arctic conditions; and

be it

FURTHER RESOLVED that the Alaska Legislature believes that the report mandated by the Congress in the Oil Pollution Act of 1990 should be reviewed and an environmental assessment of offshore industrial operations in the Arctic be conducted before further oil and gas exploration and development activities take place in the Beaufort and Chukchi seas; and be it

FURTHER RESOLVED that the Alaska State Legislature believes that more research is needed focusing on the unique and unpredictable conditions found in the Arctic, in terms of oil spill contingency plans and the effect of exploration and development in general as well as specific research to determine the effect of industrial noise on marine mammals and especially on the bowhead whale.

COPIES of this resolution shall be sent to the Honorable George Bush, President of the United States; to the Honorable Dan Quayle, Vice-President of the United States and President of the U.S. Senate; to the Honorable Thomas S. Foley, Speaker of the U.S. House of Representatives; to the Honorable Manuel Lujan, Jr., Secretary of the Interior; to Barry Williamson, Director of the Minerals Management Service; and to the Honorable Ted Stevens and the Honorable Frank Murkowski, U.S. Senators, and the Honorable Don Young, U.S. Representative, members of the Alaska delegation in Congress.

7-LS1046\G
Chenoweth
4/11/91

CS FOR HOUSE JOINT RESOLUTION NO. 36 (O&G)

IN THE LEGISLATURE OF THE STATE OF ALASKA

SEVENTEENTH LEGISLATURE - FIRST SESSION

BY THE HOUSE SPECIAL COMMITTEE ON OIL AND GAS

Offered:
Referred:

Sponsor(s): REPRESENTATIVES MACLEAN, Hudson, Jacko, Koponen, Donley, Finkelstein, Brown, Ivan, Kubina, Ulmer

A RESOLUTION

Relating to off-shore oil exploration, development, and tanker transportation activities in the Beaufort and Chukchi seas.

BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF ALASKA:

WHEREAS the state supports the prudent and orderly development of the state's oil and gas reserves in an environmentally sound manner; and

WHEREAS the state has been responsive to the nation's need to decrease its dependence on foreign oil; and

WHEREAS the oil industry has demonstrated that properly regulated onshore oil and gas exploration, development, and transportation can occur in an environmentally sound manner; and

WHEREAS there is a high probability that the coastal plain of the Arctic National Wildlife Refuge contains economically recoverable oil reserves; and

WHEREAS, following the expedited environmental assessment by the Outer Continental Shelf Task Force, the President announced in June 1990 the closure until the year 2000 of large outer continental shelf tracts off the coast of California, Florida, New England, and the Northwest to oil and gas leasing and activities; and

WHEREAS, without having subjected Alaskan water to a similar environmental assessment, the

federal government proposes to conduct in June and August of 1991 oil and gas lease sales in the Beaufort and Chukchi seas totalling more than 40,000,000 acres; and

WHEREAS Alaskan water, particularly arctic water, deserves the same scrutiny regarding the wisdom and environmental safety of oil and gas activities as was given to water offshore of the contiguous states; and

WHEREAS the Beaufort and Chukchi seas are among the world's most dynamic and relatively unspoiled wildlife habitats, containing critical feeding and breeding grounds, rest and brooding areas, and migratory corridors where a wide variety of marine mammal, bird, and fish species concentrate; and

WHEREAS land adjoining the arctic water has been the home of the Inupiat Eskimo people for countless generations; and

WHEREAS the Inupiat largely derive their nutritional needs and cultural identity through the traditional harvest of marine species, particularly the endangered bowhead whale and other marine mammals; and

WHEREAS an oil spill in the Arctic could cause irreparable damage to the marine resources in these waters and thus devastate the people of North and Northwest Alaska; and

WHEREAS the limited amount of well designed and successfully conducted scientific research that has been conducted in the Arctic has indicated that marine mammals and birds react to industrial noise, including noise for drilling, seismic activity, and icebreaker and other vessel disturbances, with effects and potential threats to their well-being not yet fully understood; and

WHEREAS the arctic environment is characterized by extreme weather conditions, including prolonged ice cover and darkness, frigid temperatures, high winds and waves, and low visibility; and

WHEREAS effective oil spill response options for remote arctic water remain undemonstrated as has been acknowledged by the Alaska Oil Spill Commission, the Arctic Research Commission, and the Mineral Management Service itself; and

WHEREAS the Prince William Sound and Cook Inlet spills and the many recent significant spills in the contiguous states evidence both the insufficiency of the oil industry's preventative safety measures, and the industry's inability to respond effectively to a major spill in even less remote, warmer, well-lit, ice-free waters where hundreds of private citizens and vessels have aided in response efforts; and

WHEREAS, even with the formulation of industry spill contingency plan and response requirements, as mandated by legislation passed during the 1990 legislative session, there remains a lack of the community response preparedness vital to a rapid response, containment, and cleanup effort

following a spill; and

WHEREAS a major oil spill, particularly the result of a tanker accident or late season well blowout, could have multi-year devastating effects on the sensitive arctic marine environment, wildlife resources, and subsistence lifestyle of the Inupiat people; and

WHEREAS the Oil Pollution Act of 1990, P.L. 101-380, 104 Stat. 484, directed the Secretary of the Interior, in consultation with the Governor of Alaska, to prepare an extensive report on a variety of issues relating to offshore oil spill contingency planning in the Arctic, with particular attention to be given to Native concerns; and

WHEREAS the report will likely be published no later than May 1991 and could clearly serve as the initial step in conducting the essential environmental assessment that arctic water has yet to be subjected to; and

WHEREAS the Secretary of the Interior is therefore charged with producing a landmark comprehensive report to the Congress on the state of oil spill contingency planning in arctic water, and at the same time the secretary is preparing to offer for lease a short time after the report is due to be published more than 40,000,000 acres of offshore tracts in those same arctic waters without the benefit of his own, the Congress', or the public's review of that report;

BE IT RESOLVED that the Alaska State Legislature recognizes the potentially harmful effects of industrial noise and oil spills on the arctic marine environment, wildlife resources, and the Inupiat Eskimo culture; and be it

FURTHER RESOLVED that the Alaska State Legislature believes that the oil industry does not have, or at least has yet to conclusively demonstrate, the ability to adequately respond to, contain, or clean up a significant oil spill in arctic water under commonly occurring environmental conditions; and be it

FURTHER RESOLVED that the Alaska State Legislature recognizes the need and the right to have Alaskan water, particularly in the Arctic, subjected to the same environmental risk assessment that has been applied to water offshore of the contiguous states; and be it

FURTHER RESOLVED that the Alaska State Legislature believes that the Secretary of the Interior should not proceed with planned offshore lease sales in the Arctic until he, the Congress, and the public have the opportunity to review the report that he himself has been directed by the Congress to produce on oil spill contingency planning in the Arctic.

COPIES of this resolution shall be sent to the Honorable George Bush, President of the United States; to the Honorable Dan Quayle, Vice-President of the United States and President of the U.S.

Senate; to the Honorable Thomas S. Foley, Speaker of the U.S. House of Representatives; to the Honorable Manuel Lujan, Jr., Secretary of the Interior; to Barry Williamson, Director of the Minerals Management Service; and to the Honorable Ted Stevens and the Honorable Frank Murkowski, U.S. Senators, and the Honorable Don Young, U.S. Representative, members of the Alaska delegation in Congress.

HOUSE JOINT RESOLUTION NO. 36

IN THE LEGISLATURE OF THE STATE OF ALASKA

SEVENTEENTH LEGISLATURE - FIRST SESSION

BY REPRESENTATIVES MACLEAN, Hudson, Jacko, Koponen, Donley, Finkelstein, Brown, Ivan, Kubina, Ulmer

Introduced: 4/2/91

Referred: House Special Committee on Oil and Gas, Resources

A RESOLUTION

Relating to off-shore oil exploration, development, and tanker transportation activities in the Beaufort and Chukchi seas.

BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF ALASKA:

WHEREAS the state supports the prudent and orderly development of the state's oil and gas reserves in an environmentally sound manner; and

WHEREAS the state has been responsive to the nation's need to decrease its dependence on foreign oil; and

WHEREAS the oil industry has demonstrated that properly regulated onshore oil and gas exploration, development, and transportation can occur in an environmentally sound manner; and

WHEREAS there is a high probability that the coastal plain of the Arctic National Wildlife Refuge contains economically recoverable oil reserves; and

WHEREAS the Beaufort and Chukchi seas are among the world's most dynamic and relatively unspoiled wildlife habitats, containing critical feeding and breeding grounds, rest

and brooding areas, and migratory corridors where a wide variety of marine mammal, bird, and fish species concentrate; and

WHEREAS land adjoining the arctic water has been the home of the Inupiat Eskimo people for countless generations; and

WHEREAS the Inupiat largely derive their nutritional needs and cultural identity through the traditional harvest of marine species, particularly the endangered bowhead whale and other marine mammals; and

WHEREAS the limited amount of well designed and successfully conducted scientific research that has been conducted in the Arctic has indicated that marine mammals and birds react to industrial noise, including noise for drilling, seismic activity, and icebreaker and other vessel disturbances, with effects and potential threats to their well-being not yet fully understood; and

WHEREAS the arctic environment is characterized by extreme weather conditions, including prolonged ice cover and darkness, frigid temperatures, high winds and waves, and low visibility; and

WHEREAS, with the formulation of industry spill contingency plan and response requirements, as mandated by legislation passed during the 1990 legislative session, increased focus on community response preparedness that is vital to a rapid response, containment, and cleanup effort following a spill; and

WHEREAS oil industry representatives with offshore Arctic interests and the federal government have contributed to a significant number of scientific studies on fish and marine mammals; and

WHEREAS there have been some positive efforts by the industry to identify and train North Slope residents to respond in the event of oil spill or other emergencies; and

WHEREAS Arctic offshore oil industry operators have successfully negotiated major revisions to the Federal Incidental Take Regulations with the Alaska Eskimo Whaling Commission which, among other things, establishes limits on oil exploration in arctic waters; and

WHEREAS there is a continuing need for counsel, communication and cooperation between members of the petroleum industry and the communities that may be impacted by its activities;

BE IT RESOLVED that the Alaska State Legislature believes that the oil industry has a special obligation to help preserve the Arctic environment and to carefully proceed with its activities in full consultation with the local residents; and be it

FURTHER RESOLVED that the Alaska State Legislature urges continuing research to improve the technology necessary to contain, control and clean up oil spills in the Arctic

environment and to continue to assess impacts on fish and marine mammals.

COPIES of this resolution shall be sent to the Honorable George Bush, President of the United States; to the Honorable Dan Quayle, Vice-President of the United States and President of the U.S. Senate; to the Honorable Thomas S. Foley, Speaker of the U.S. House of Representatives; to the Honorable Manuel Lujan, Jr., Secretary of the Interior; to Barry Williamson, Director of the Minerals Management Service; and to the Honorable Ted Stevens and the Honorable Frank Murkowski, U.S. Senators, and the Honorable Don Young, U.S. Representative, members of the Alaska delegation in Congress.

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF THE COMMISSIONER

WALTER J. HICKEL, GOVERNOR

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

April 12, 1991

The Honorable Bill Hudson, Chair
House Special Committee for Oil and Gas
P.O. Box V
Juneau, AK 99811

Dear Representative Hudson:

Subject: HJR 36, which relates to off-shore oil exploration, development, and tanker transportation activities in the Beaufort and Chukchi seas.

Position: The Department of Natural Resources opposes this resolution. The statements it contains are so strong that, if the resolution is enacted, it will directly affect the state's ability to continue oil and gas leasing offshore or near water bodies. We ask the Committee and the Legislature to carefully consider the unsubstantiated statements in this resolution, as well as the subsequent implications for the state's own oil and gas leasing program, before moving it to the next committee of referral.

Many federal offshore areas in Alaska have already been leased. The Hickel administration has taken a strong stance with the federal government to ensure that federal sales are as protective of subsistence activities and have as high a standard for oil spill prevention as state sales. A resolution of this type does not help these efforts.

The resolution appears to mix concerns about tanker accidents such as the Exxon Valdez with concerns about the risks of offshore oil and gas exploration and development. Before the Legislature commits itself to these statements it should make certain they are substantiated.

Recommendation: Allow the federal Minerals Management Service (MMS) an opportunity to appear before the committee and explain the results of noise studies and other studies that relate to the resolution's statements, as well as to describe federal oil spill prevention and clean-up requirements for offshore Alaska exploration and development. Recognize the high standards of protection and prevention established by the state for offshore oil and gas exploration, development and transportation. Amend the resolution accordingly.

Sincerely,

Harold C Heinze

Harold C. Heinze
Commissioner

10-J9LH

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STATE OF ALASKA

WALTER J. HICKEL, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

HJR 36 - BEAUFORT AND CHUKCHI SEA EXPLORATION DRILLING MORATORIUM

Level of Activity

To date, there have been few exploratory drilling operations in the Chukchi Sea and Beaufort Sea Outer Continental Shelf (OCS).

Chukchi Sea:

* Drilling only during summer open water period.
* Shell Western has drilled in 1989, 1990, and plans to drill in 1991.
* Texaco may drill in 1992.

Beaufort Sea:

* Nearshore drilling in winter and offshore drilling in summer open water period.
* Arco drilled during winter of 1990 and may drill in winter of 1991.
* Amoco may drill offshore during summer of 1991.

Oil Spill Prevention and Response

The U.S. Department of the Interior, Minerals Management Service (MMS) requirements establish a level of response preparedness similar to those outlined in draft State oil-spill regulations and HB 567.

Spill Drills:

* Two oil spill response drills each year.
* North Slope Borough and State agencies are invited to attend all drills. DEC staff have attended all drills.

Monitoring & Inspection

* An MMS inspector is stationed on offshore drill ships to inspect spill prevention and emergency response systems.
* MMS inspects onsite response equipment on a daily basis, and attendant vessel equipment weekly.

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To [illegible] From [illegible] D.J.C.

* MMS inspects offsite equipment inventories annually, prior to the open-water drilling season.

* Companies are required to have a scheduled maintenance program for response equipment. MMS inspects company records for compliance with the maintenance schedule.

Spill Technology: * MMS sponsored the Alaska Artic Offshore Oil Spill Response Technology Workshop in November-December 1988.

* MMS, in cooperation with Environment Canada and U.S. Coast Guard, has initiated a major effort to refurbish the only spill response test facility in the United States (OHMSETT) to test Arctic spill containment and cleanup technologies.

Local Involvement: * The industry's spill response co-operative, Alaska Clean Seas, is working with the Arctic Slope Regional Corporation to train residents of North Slope villages in oil spill response and cleanup.

* The Arctic Marine Resources Commission participates as a member of DEC's HB 567 Technical Implementation Work Group.

United States Department of the Interior

MINERALS MANAGEMENT SERVICE

ALASKA OUTER CONTINENTAL SHELF REGION
949 E. 36TH AVENUE, ROOM 110 ANCHORAGE, AK 99508-4302

APR 23 1991

Representative Bill Hudson,
Chairman
House Special Committee on
Oil and Gas
Alaska State Legislature
P.O. Box V
Juneau, Alaska 99811

Dear Representative Hudson:

I appreciated the opportunity to testify to the committee on the proposed HJR 36 on April 22, 1991. I am enclosing a copy of information relating to the Minerals Management Service's regulatory program, environmental studies, and other background material, some of which I presented and discussed during my testimony and which I believe the committee will find useful in its further discussions regarding HJR 36.

I would be glad to answer any questions or provide any additional information.

Sincerely,

Irven F. Palmer, Jr.

Irven F. Palmer, Jr.
Acting Regional Director

Enclosure

MINERALS MANAGEMENT SERVICE
INFORMATION RELEVANT TO PROPOSED HJR 36

Background

Offshore oil and gas leasing, exploration and development and production is not new to the Beaufort and Chukchi Seas. The State of Alaska has conducted 13 lease sales which included offshore lands in the Beaufort Sea and has more planned. The Federal Government has held four sales in the Beaufort Sea including the joint Federal/State sale in 1979 and one in the Chukchi Sea.

Twenty-five exploratory wells have been drilled in the Beaufort and Chukchi Seas on Federal leases; over 100 wells have been drilled on State submerged lands in the Beaufort Sea and over 60 wells have been drilled in the Canadian Beaufort Sea. The Endicott Development Project on State submerged lands has been producing offshore oil since 1987.

Oil Pollution Act Report

One of the recommendations of HJR 36 is that Federal offshore lease sales in the Arctic not proceed until the Secretary, the Congress, and the public have had the opportunity to review a report required by Section 8302 of the Oil Pollution Act of 1990 (OPA). The OPA does not require, and the Congressional history of the OPA does not suggest, that the Outer Continental Shelf (OCS) leasing program be delayed pending completion of the report. The report will not provide new information on the lease sales planned for this summer.

The current plan is that a draft will be available for public review in May and the final report delivered to the Congress in August.

The OPA directs the report to cover three subjects: recovery of damages, contingency plans, and coordinated actions in the event of an oil spill in the Arctic Ocean. The language of Section 8302 shows that the principle impetus for the report is concern over spills resulting from tankering of crude oil from the Canadian Beaufort, and the administrative and legal mechanisms for recovery of damages from such oil spills.

The report will include information on Federal, State, local and Canadian and private contingency plans and requirements, but will not address the adequacy of spill-response preparedness, current state-of-the-art technology for spill response, or the effects of industrial noise or spills on wildlife in the region.

Environmental Studies and Assessments

The Minerals Management Service (MMS) has spent over $245 million dollars in environmental studies for the Alaska OCS Region since 1974. Over one half of that total has been directed at the Arctic. Approximately $22 million has been spent on studies directly related to bowhead whales.

The MMS studies program has addressed a comprehensive list of subjects:

- o Oil-spill fates and effects;
- o Social, and economic and subsistence effects;
- o Living resources;
- o Endangered species;
- o Environmental monitoring;
- o Pollutant transport;
- o Environmental geology; and
- o Ecosystems.

Organizations other than the MMS have also funded OCS-related studies. The National Marine Fisheries Service (NMFS), the State of Alaska, the North Slope Borough, the Alaska Eskimo Whaling Commission, the Union of Soviet Socialist Republic, Canada and the oil industry have funded almost $24 million on bowhead whale studies through 1989.

The MMS has prepared seven Environmental Impact Statements (EIS's) for OCS lease sales in the Beaufort and Chukchi Seas. These EIS's have gone through extensive public review and comment, and are based on the most current scientific data and information.

The EIS's are comprehensive analyses of the potential effects of oil and gas activities on the natural and human environments. Through the EIS process, including State and public review, the MMS identifies and mitigates potential effects.

The MMS has also prepared environmental assessments (EA's) on each of the 21 exploration plans (EP's) which have been submitted for the Beaufort Sea and the 3 plans for the Chukchi Sea. The EA's analyze potential environmental effects, and incorporate any information that may have become available since the last EIS.

Arctic waters have been subjected to considerable environmental assessment. Since the OPA report is limited in scope, as directed by the Congress, it will not modify the results of those assessments.

EFFECTS OF NOISE ON MARINE MAMMALS

There have been several studies on the effects of industrial noise on marine mammals, particularly bowhead whales.

Studies on the effects of industrial noise on marine mammals conclude that while marine mammals react to industrial noise, the reactions are localized and short term.

The MMS has evaluated the potential effects of oil and gas activities on marine mammals including bowhead whales in EIS's prepared for OCS sales, most recently Sales 124 and 126.

The Sale 124 EIS concludes that potential effects to marine mammals from noises are low.

The EIS analyses are conservative. The EIS does not assume that special mitigating measures will be in place or that spilled oil will be contained, removed, or cleaned up. The MMS has developed mitigating measures specifically for the protection of bowhead whales and subsistence hunting, including effects from noise. These measures include requirements for site-specific monitoring for the presence of whales and effects on their behavior. The MMS also requires that lessees consult with, and coordinate their activities with local subsistence communities to avoid and minimize interference. Limitations are also placed on seismic operations during the bowhead whale migration and lessees are warned to keep their operations, including vessels and aircraft, at specified distances from marine mammal and bird concentrations.

The NMFS, after reviewing the available scientific information on noise effects on bowhead whales, concluded in the Arctic Regional Biological Opinion "that although some impacts [from noise] to individuals [bowhead whales] may occur, anticipated proposed exploratory activities will not produce noise levels expected to reduce appreciably the likelihood of survival and recovery of the bowhead whales by reducing the reproduction, numbers, or distribution of the species."

In their final regulations for the non-lethal incidental taking of marine mammals adopted in July 1990 for oil and gas exploration and seismic activities in the Beaufort and Chukchi Seas, the NMFS further concluded there would be no significant impact on the populations of marine mammal and that there would be no unmitigable adverse impacts on the availability of the species for subsistence use if certain conditions are met. The conditions required by the NMFS regulations are site-specific monitoring programs and coordination between industry and subsistence communities similar to MMS lease terms.

Postlease Regulatory Program

The MMS has a stringent regulatory program to ensure that offshore oil and gas operations are conducted in a safe and environmentally-sound manner.

This program establishes specific requirements and standards for offshore operations, includes a comprehensive permitting process involving a thorough review of each proposal, and a compliance and inspection program to ensure that each activity is conducted in accordance with regulatory and lease requirements.

Major components of the program include well control and spill prevention.

Before any exploration or development activity can begin, an EP or development and production plan must be approved by the MMS. Each plan undergoes public review and comment and an EA is prepared. The State must also concur that the plan is consistent with the Alaska Coastal Management Program before an activity can be conducted.

Inspection and Compliance

The MMS has a very stringent inspection program in Alaska.

In the Alaska OCS Region, we maintain an inspector on each offshore drilling rig on a continuous or near-continuous basis to ensure that all applicable requirements are being met and that the well is being drilled in a safe manner. We observe all critical operations such as mandatory testing of blowout preventors.

Oil Spills

There have been no blowouts resulting in the release of crude oil from nearly 10,000 exploratory wells drilled on the OCS. The blowouts which have occurred were gas blowouts mostly in areas where shallow gas is prevalent.

Because of the Exxon Valdez spill, many question industry's ability to respond to a major oil spill, such as a blowout from an exploratory well in the Arctic.

It is important to distinguish between oil spills resulting from tanker accidents and spills that could occur from offshore oil and gas operations.

In contrast to tankers, OCS exploration and development and production operations are confined to specific locations where we require onsite spill-response teams and equipment tailored to the type of activity, environmental conditions, and maximum anticipated spill.

Spills from OCS exploratory drilling and production activities would not result in large instantaneous spills such as a tanker spill.

Spill response would be much more effective on a smaller continuous spill that provides continuous fresh oil in moderate volumes than a response to a single massive release of oil, such as occurred from the Exxon Valdez.

The MMS has taken prudent and effective steps to significantly reduce the risk of a spill and to ensure that industry utilizes the best available equipment and technology to drill and produce oil in the Arctic, and to respond to a spill.

There have been substantial improvements in oil-spill-response technology as a result of research and testing by the MMS in concert with Environment Canada and others, and as a result of the State's Tier II program.

In situ burning is a major response strategy for the Arctic, particularly for environmental conditions which might preclude or limit a mechanical response.

Research and testing of in situ burning in test tanks, offshore field trials, and under actual spill conditions have provided documentation on the effectiveness of in situ burning.

Other recent initiatives such, as Alaska Clean Seas' expanded equipment inventories and response organizations, the Regional Response Team's Memorandum of Understanding for preapproval to use in situ burning in the Beaufort and Chukchi Seas, and development of other guidelines and checklists, have improved and facilitated response capabilities and preparedness in the Arctic.

Conclusion

Based on the past drilling and production history in the Arctic and the comprehensive environmental studies and evaluations which have been conducted, the MMS is confident that offshore oil exploration and development in the Beaufort and Chukchi Seas can continue to be conducted in an environmentally-sound manner.

There is ample information regarding the risks of oil and gas operations to proceed with the proposed Beaufort and Chukchi lease sales.

Regulatory requirements for oil-spill-response preparedness, advances in technology in oil-spill response, including in situ burning, and a stringent regulatory and inspection program to prevent oil spills assure that operations are conducted in an environmentally-sound manner.

The MMS requires that industry demonstrate an acceptable level of spill-response preparedness and that current technology is suitable for the maximum anticipated spill which could occur from such activities.

Several oil and gas lease sales and exploration drilling have been conducted in the Beaufort and Chukchi Seas starting with the joint Federal/State Beaufort Sea lease sale in 1979 and there has been a very thorough analysis of all potential effects, including State and local involvement, leading up to each proposed Beaufort and Chukchi lease sale.

The MMS believes that proceeding with the decision-making process for planned Arctic OCS lease sales using the mandated and administrative coordination processes in place is appropriate and little would be gained by delaying the sales for review of the report being prepared under the requirements of Section 8302 of the OPA of 1990. Simply put, the report is not going to shed much light on most of the issues raised in HJR 36.

Testimony on HJR 36

Robert R. Griffeth
Senior Consultant, Environmental Affairs-Offshore
ARCO Alaska, Inc.
April 26, 1991

My name is Bob Griffeth. I am a member of the Environmental Sciences Department staff at ARCO Alaska, Inc. Thank you for this opportunity to offer some commentary on HJR 36.

Among the duties I perform in my assignment with ARCO are organizing and presenting the environmental orientation programs associated with exploratory drilling projects; overseeing the marine mammals scientific and monitoring programs for offshore exploratory operations; coordinating and maintaining cooperative programs with North Slope Inupiat villages; and serving as principal liaison with North Slope villages oil spill response teams.

Much of the testimony and discussion focusing on House Joint Resolution 36, which this committee is considering, directly touches areas of my professional activities. Therefore, I would like to take this opportunity to comment on three particularly relevant areas: (1) The recent history of cooperative programs between offshore oil and gas industry operators and North Slope Native communities. (2) The design and results of marine mammals science and monitoring programs. And (3) the village oil spill response teams which serve as observers, advisers, and participants for industry's offshore oil spill contingency planning and response preparedness.

Since the earliest days of petroleum exploration and development on the North Slope, industry has recognized both the advisability and desirability of fostering programs of mutual benefit to itself and to the resident Inupiat communities. In the early years, these efforts were primarily directed to training and employment opportunities. Such programs remain strong and active today. In other instances the basis for cooperation keys off of joint business ventures between industry and the Native regional and village corporations. Here again, joint venture programs continue to be an essential and vital feature of industry-local resident relations.

In more recent times, the overriding concerns of the area have come to be offshore oil exploration activities that are viewed by some as potentially harmful to marine mammal subsistence resources or in conflict with Native subsistence pursuits. The bowhead whale hunt has been the focal point of this concern for North Slope residents and industry operators alike since both parties are, at times, environmentally constrained to simultaneously operate during the open water conditions when the annual fall whale migration through the Beaufort Sea occurs.

For the past five years, a Cooperative Program for the Beaufort Sea (commonly referred to as the Oil/Whalers Agreement) has been in effect between the Alaska Eskimo Whaling Commission, the whaling captains' associations of Nuiqsut and Kaktovik (which, along with Barrow, constitute the only Beaufort whaling villages) and industry. Prior to the open water season, whaling captains and industry representatives meet to work out a communications system between the parties that prevents use conflicts

between active whaling crews and industry operations. This cooperative effort has succeeded. It has also produced additional benefits to both parties. Industry has been allowed to proceed with exploratory activity and in the process has become very familiar with, and keenly sensitive to, both the practical and cultural dimensions of the Inupiat subsistence hunt. Safety assistance has also been provided to whaling crews in distress on certain occasions. Most of all, the focus on whaling and the fall bowhead migration has created a situation in which industry has proved itself both willing and able to work cooperatively with the Native subsistence communities on what is chief among their concerns about offshore exploration.

While this example touches on the experience gained from cooperative efforts between industry and Inupiat whalers from the Beaufort Sea communities; other efforts have involved environmental projects, archaeological and cultural matters, and local community activities. Without question, however, our highest mutual priority continues to be gaining a better understanding of the dynamics of the offshore arctic environment and scientific and monitoring studies of marine mammals there.

ARCO, and other industry offshore operators, have recognized that the local expertise and deep knowledge possessed by subsistence hunters absolutely must be incorporated in any study or monitoring programs. Effectively, this is done in two ways. First, by consulting with both whaling captains' associations and the North Slope Borough's Department of Wildlife Management in the design and scientific assessment of results of studies. Second, by including experienced Inupiat monitors in the actual field work associated with the studies. This approach has vastly enriched the quality

and credibility of study results. The benefits to both industry and the whaling communities are obvious. Industry operators can tailor their operations to cause the least possible interference with the subsistence hunt; the whaling community can, in turn, reinforce with hard scientific evidence its long held view that the bowhead whale population is healthy and can sustain an annual take of up to fifty animals. Both of these benefits have been realized from studies conducted over the past several years. I would be happy to supply additional information on these efforts to the committee. I can provide for the record, a detailed report of cooperation and consultation undertaken between industry and the whaling communities and final study reports from recent science and monitoring programs, if you would like to include them.

The final matter which I would like to touch on concerns the extent to which industry consults and incorporates the knowledge of local residents in dealing with oil spill preparedness and response. This committee recently received written testimony saying that ". . . local knowledge of experience[d] whaling captains and hunters and researchers continue[s] to be overlooked. I would like to see our local experts actively participate in the assessment of the oil industr[y's] ability to clean up an oil spill. This includes monitoring oil spill clean up drills that the state calls for occasionally to see if the oil industry is ready to respond to a spill."

There has been similar testimony from several other witnesses at previous hearings on this Resolution.

Local captains, hunters and residents **have** shared in the development of our Arctic programs. In the summer of 1989, ARCO recruited and provided oil spill response technician training (a 40 hour course) to ten residents each in the villages of Nuiqsut and Kaktovik. Members of these two teams included whaling captains (such as Mickey Agiak and George Kaleak of Kaktovik) and crew members (such as Isaac Nukapigak and Tony Cabinboy of Nuiqsut). Each of these individuals plus other team members fully participated in on-site oil spill response drills and demonstrations under all types of environmental conditions (open water, broken ice, and solid ice) at two different Beaufort Sea offshore exploratory drilling locations in 1989 and 1990. In late summer 1990 the initial phases of training were completed for a third ten-member team which included representatives from the Barrow volunteer fire department. Presently, the Alaska Clean Seas Co-op and response organization is continuing and expanding the village response team program in North Slope Borough communities.

This training program serves both the needs of oil companies operating in the area and the continuing needs of North Slope communities. Trained team members have reviewed contingency plans and have offered suggestions that resulted in specific improvements. The North Slope Borough has been an active partner in staging and supporting the training program.

I wish to conclude by stating that ARCO Alaska, Inc. and other offshore Arctic operators, fully intends to maintain the patterns of consultation and cooperation we have established over the years. As has been discussed by some individuals recently, a more formal regional citizens advisory group for

the Beaufort and Chukchi lease sale areas may be established. ARCO would welcome and support such a development.

Thank you for the opportunity to share this information with you. If you have any questions, I would be happy to respond.

NORTH SLOPE BOROUGH TESTIMONY ON HRJ 36
HOUSE SPECIAL COMMITTEE ON OIL AND GAS
APRIL 15, 1991

The issues dealt with in HJR 36 can quickly become very complicated if you let them. Inconsistencies in the administration and interpretation of local, state and federal laws by state and local agencies has made the reviews of offshore lease sales, exploration and oil spill contingency plans, and related matters far more complex than they need have been. In the process, the views and concerns of Alaska's northern coastal residents have been obscured by scientific, legalistic, and economic debates which have failed to produce more than paper assurances that industrial operations can be conducted offshore in the Arctic without risking significant harm to the marine environment and the Inupiat Eskimo culture. Simple, critical questions have remained unanswered as the interest in offshore exploration in arctic waters has intensified in recent years. This resolution sponsored by Representative MacLean and others does nothing more than demand that the State of Alaska better investigate and understand the risks of these activities before continuing to support them. Every statement in the resolution is true, and to the extent that negative statements can be proven, each can be substantiated by the scientific and anecdotal records.

If you objectively examine the available data on arctic wildlife resources, the dependence on them among our Native residents, the lack of definitive data regarding the impacts of noise and oil on subsistence resources, the harsh realities of the arctic environment, and the limitations of oil spill response options in the Arctic, we believe that you will find our concerns and recommendations reasonable.

CONTINUUM

WHEN IS A WHALE LIKE A BAT?

A crystalline curtain of ice extending more than 70 feet below the Arctic Ocean loomed in the path of a herd of migrating bowhead whales. A scout whale, swimming about a mile ahead of the herd, detected the ice by bouncing a low, moaning cry off the blockage. Alerted, the animal then increased the rate of its vocalizations, signaling the rest of the herd.

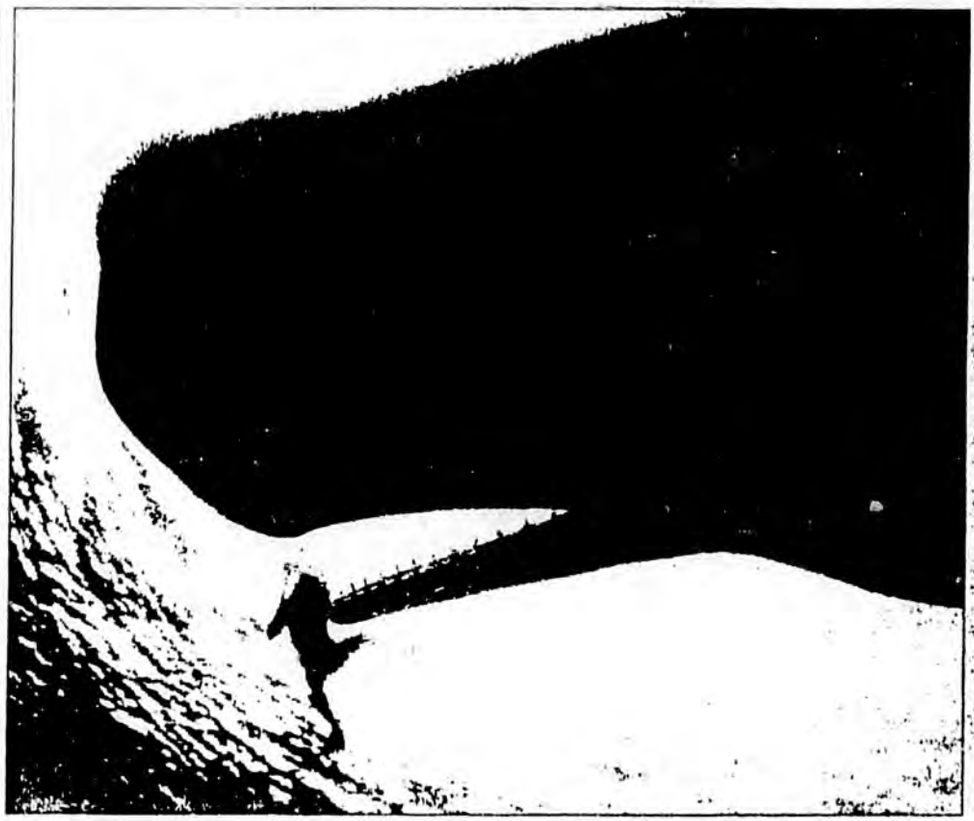
Aided by its scout, the herd began to turn well ahead of the obstruction. This event is being called the first known example of large mammals using echoes of their own sounds for navigation. Christopher Clark, director of bioacoustics programs at Cornell University, and William Ellison of Marine Acoustics plotted the courses of bowheads off Point Barrow, Alaska, both visually and with hydrophones. Circumstantial evidence, says Clark, points to the conclusion that the whales are using low frequency echolocation.

"In general, bowheads chatter back and forth so the group can stay together. But when they detect heavier ice, the amount of their chatter increases. We call it a burst mode," he explains.

"When we look at where the whale tracks and the ice blockages were on our plotting board, we see that they didn't swim up to the ice and bump their noses. They started to change course before they made visual contact. It all adds up that they hear echoes and swim around ice. Not only that, but the animals behind the lead whales started turning several kilometers before they approached blockages. This suggests that whales are hearing their colleagues and their echoes.

"The emerging picture is that these animals have a very refined and sophisticated acoustic, spatial map of their environment. They make sounds and listen to sounds of their surroundings to help themselves survive in an incredibly hazardous environment," Clark says.

—Joel Schwarz



Whale song is also collective sonar. Researchers are learning that the haunting sounds produced by a single "scout" whale can help an entire pod navigate in its hazardous environment.

SLIDE RULES SAVED

Once, slide rules ruled. But all that changed in 1972, when calculators that could handle logarithms and other complex functions were put on the market. "Never has anything once as common as slide rules disappeared so fast," says Art Orans of Philomath, Oregon. "There's not one American company making them anymore. Somebody has to save slide rules, or they'll go the way of the dinosaurs."

Toward that end Orans has established the Philomath International Slide Rule Society. Its goal: to collect and preserve the endangered objects. So far more than 400 people have joined by donating a slide rule to the cause. Orans notes that the mechanical calculators come in all shapes and sizes: "I have several tiny, working tie-tack models—sort of designer jewelry for nerdy-type engineers. And there's a ten-foot-long slide rule that once hung on a high-school class wall."

What's the appeal of a slide rule compared with a modern pocket calculator? "You have a challenge with a slide rule," Orans answers

BRISTOL BAY NATIVE ASSOCIATION
P.O. BOX 310
DILLINGHAM, ALASKA 99576
PHONE (907) 842-5257

April 25, 1991

Representative Bill Hudson
Chairman, House Oil & Gas Committee
P.O. Box V
Juneau, Alaska 99811

Dear Representative Hudson:

I am writing to you on behalf of the members of the Bristol Bay Native Association in support of HJR 36 which is currently in your committee.

BBNA adamantly opposes offshore oil development. Recent and current developments in national oil policy make this a pressing issue, particularly in Alaska where our coastal weather conditions and recent experience with the Exon Valdez clean up are vivid in our being. While certain differences exist between the Siberian/Bering Sea weather factory and conditions of the Japanese Current/North Pacific zone, and between the biosphere of Bristol Bay and that of the Chukchi Sea, the overriding fact of our total dependence on the sea remains the same.

Please pass HJR 36 out of the oil and gas committee as soon as possible - while its influence on national oil policy might be the greatest.

Thank you.

Sinceerely,

Terry Hoefferle
Executive Director

cc: Representative George Jacko
Senator Fred Zharoff
Members, House & Senate Oil & Gas Committees
Senator Ted Stevens
Senator Frank Murkowski
Congressman Don Young

January 15, 1991

Pamela A. Bergmann
Regional Environmental Assistant
Office of Environmental Affairs
U.S. Department of the Interior
1689 C Street, Room 119
Anchorage, Alaska 99501-5126

Dear Pamela:

The meeting in Kotzebue was very helpful. The schedule for reviewing your report to Congress does not leave us much time to comment, but we appreciate any opportunity to express our concerns regarding oil development and transportation in the Arctic.

Based on the Kotzebue meeting, we will not focus on oil tankers, but instead we will address oil issues in a broader context. Furthermore, you indicated that you are more interested in a listing of concerns. If more detail is needed, please contact us.

We also wish to receive a review copy of the draft report prior to its completion and submittal to Congress.

Below is a list of our major concerns relative to oil development and transportation in the Arctic:

A. Exploration Phase

1. Successful exploration will result in development activities, regardless of the extent of knowledge concerning environmental and social impacts. While we are not opposed to exploration, we do not believe that exploration should proceed until the environmental and socioeconomic impacts of such activities are better understood and effective measures for

mitigating those impacts have been developed and are in place.

2. Oil spill response technology in the Arctic is unproven and at present inadequate. Too little thought has been given to oil spill cleanup under Arctic conditions by the industry and the federal government.

B. Development Phase

1. Impacts, both positive and negative, on communities that serve as the base of operations or support for development activities need to be thoroughly assessed. This is especially critical for smaller Native communities.

2. Impacts on larger communities, such as regional centers like Kotzebue, that are not physically close to the lease area but still function as a supply center or support base must also be addressed. Often, the extent of the area impacted by OCS activities is greater than the federal government or industry recognizes.

3. The potential for oil spills increases and a spill could occur at any time, under any conditions.

C. Production Phase

1. The likelihood of a spill of major proportions increases substantially during the production phase. Again, a spill can occur under any circumstances and at any time of year.

2. Oil spill response technologies are unproven in the Arctic. Even MMS points out that the present technology and industry capabilities are inadequate for a spill in ice-covered waters (Chukchi Sea OCS Lease Sale #126 DEIS).

3. The industry and the federal government don't appear to be as diligent as warranted about identifying and mitigating adverse impacts from OCS activities in environmentally sensitive and climatically harsh regions. Areas of concern include offshore regions that host migratory marine mammals as well as onshore areas that provide habitat for a variety of species important as subsistence resources.

4. A conscientious and meaningful effort to provide opportunities for training and employment of local

residents should be considered an integral part of any planning activities for oil development in the Arctic.

5. Options for transporting oil from the Arctic must be carefully and thoroughly evaluated. Before any decisions are reached as to transporting oil by tanker, for example, a thorough assessment of the applicability of existing facilities should be conducted. To the extent possible, existing infrastructure should be utilized for future oil production.

6. If oil is transported by tanker, adequate oil spill response equipment must be available in a number of locations along the coast of Alaska, as far south as the Aleutians or the Alaska Peninsula, to ensure rapid deployment and effective cleanup. (This is an example of how more widespread OCS impacts are than the federal government and industry seem to acknowledge).

D. Subtitle C, Section 8902 Report Annotated Outline

1. A description of subsistence resources and the likely impacts on subsistence as a result of an oil spill needs to recognize the geographic extent of subsistence activities. Impacts from an oil spill will not be confined to marine mammals, fish and seabirds, and the coastal residents who use them, but will impact inland and terrestrial species and subsistence activities as well. This is due to the traditional sharing of subsistence resources by the Iñupiaq people. Coastal peoples trade their subsistence resources for those obtained by upriver and inland peoples. Thus, a severe reduction in coastal resources will increase the pressures on and the demand for inland resources. Furthermore, inland people travel to the coast to hunt and fish, supplementing subsistence resources they obtained inland. Finally, migration of animals, such as caribou, can be disrupted in one location due to development activities but result in negative impacts elsewhere. This can happen if, for example, the caribou alter their migration routes, making it more difficult for subsistence hunters to find them and to obtain enough animals for their needs.

2. The report also needs to recognize the seasonality of the rural economy (cash and subsistence). A major oil spill and cleanup effort in the spring and summer will occur at the busiest time of year in rural Alaska. This is when nearly all major con-

struction takes place, as well as commercial fishing and other significant economic activities (such as tourism). Extensive local hiring efforts to combat an oil spill will compete directly with the already high demands for labor during this time of year. Summer is also a critical time of year for subsistence activities. During this time, it would be very disruptive if not impossible to mount a sizeable cleanup operation out of a community like Kotzebue. The services and facilities of a regional center are generally taxed by normal summer activities, let alone a massive cleanup effort or staging operation. Consideration needs to be given in project planning to mounting a large scale effort while minimizing detrimental impacts to the local community(ies). Furthermore, local projects could be severely impacted if a large number of resident laborers opt for higher paying jobs with industry should a spill occur. Given the brevity of the construction season, loss of one summer could be ruinous to a project.

3. Alaska should be afforded a timely and meaningful opportunity to review oil exploration, development and production plans for Canadian activities, particularly if oil is to be transshipped through Alaskan or American waters, or piped across Alaska.

4. The Northwest Arctic Borough should be consulted throughout all phases of oil exploration, development and production. As we have stated above, the Borough is likely to experience impacts from oil activities, even if the activity is to the north in the Beaufort Sea. The Borough has done extensive planning through its coastal management, comprehensive planning and economic development programs, and has numerous policies in place relevant to the types of impacts that may result from various aspects of oil development.

5. Section III.B.1. addresses public sector contingency plans for oil spills. Consideration should be given in this section to the Northwest Arctic Borough (and the North Slope Borough) coastal management programs. Although these plans are not likely to focus specifically on oil spills, they do consider the resources, both human and natural, of the coastal areas within each jurisdiction. They also identify critical areas where development should either be restricted or prevented. This is germane, for example, to the location of onshore facilities such as staging areas.

6. Section III.B.2.c.ii. talks about local contingency plan requirements of the Northwest Arctic Borough

for oil activities in the North Slope Borough. We assume this refers to oil activities in the Northwest Arctic Borough. The Northwest Arctic Borough has no jurisdiction in the North Slope Borough.

NANA Regional Corporation commented on the DEIS for the Chukchi Sea Lease Sale #126. The majority of our comments and concerns are as equally relevant to this matter as they were to the proposed lease sale. Pertinent portions of these comments are summarized here for your information.

Our major concern centers on the unproven ability of the oil industry to safely drill in Arctic waters, to prevent significant accidents or oil spills, and lastly to clean up a spill of any magnitude effectively and quickly.

In fact, the DEIS for Lease Sale #126 is quite pessimistic about the ability of the oil industry to clean up an oil spill in Arctic waters, particularly in the presence of ice. As noted in Appendix L of the DEIS, MMS' own evaluation of the response and cleanup capabilities of the industry found that the majority of the equipment tested performed below ratings. In the case of application in the Chukchi Sea, summer sea conditions would preclude effective use of response equipment for 9% to 24% of the time. Ice cover, which typically occurs 9 months of the year, eliminates standard application of most mechanical response equipment.

The scenarios for mobilizing spill response teams and equipment center on transporting said teams from Barrow, Deadhorse or the Canadian Arctic. However, the minimum response times often exceed the critical initial response time required to contain and clean up the oil. In other words, the response teams will arrive too late. And once they get to the scene of the spill, they will be using equipment and techniques that, by MMS' own admission, are likely to be ineffective and made even more so by the extreme weather and sea conditions that are common to the Beaufort and Chukchi Seas.

There is a real danger in transporting oil by tanker in waters that are covered by ice substantial portions of the year. A tanker that becomes grounded or damaged by pack ice will produce an oil spill of the greatest magnitude under the worst possible conditions for an effective spill response and cleanup. One technique discussed in the Lease Sale #126 DEIS for dealing with oil spills in pack ice is to burn the oil when it reaches the top of the ice. However, as the DEIS notes, the requirements for dealing with a multitude of melted pools of ice and oil would be a "logistical nightmare". Moreover, oil spilled in the early winter is likely to remain underneath the ice for the entire winter before the ice starts melting. There was little discussion addressing the effects of significant quantities of oil trapped underneath pack ice for extended periods of time. It was noted, however, that oil trapped in pack ice may move considerable distances before the ice melts, further complicating the oil spill cleanup. Moreover, such trapped

oil may be slower to lose its volatile and therefore toxic components.

To quote the findings of the DEIS, "industry could effectively clean up an oil spill in moving ice only if the spill is a platform blowout that could be set on fire without endangering platform integrity." The implications of this statement are that the industry is severely limited in its ability to respond to oil spills of any other source or cause. In light of the severe weather conditions commonly experienced in Arctic waters, this admission is quite unsettling. As noted in the DEIS (page II-55), even recovery of most of the oil spilled from a platform is unlikely.

We hope that these comments are useful in your efforts to respond to the mandates of the Oil Pollution Act of 1990. If we may be of further assistance or can provide additional information, please contact me at the letterhead address or call 265-4100.

Sincerely,

John A. L. Rense
Vice President, Resources

cc: Walter Sampson
Vice President, Lands

Chuck Greene, Mayor
Northwest Arctic Borough

EB/111

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REPORT TO CONGRESS
OIL POLLUTION ACT OF 1990
SUBTITLE C, SECTION 8302

ANNOTATED OUTLINE

I. INTRODUCTION

Background and Objectives of Report

Describe legislative requirement and report objectives and assumptions.

II. EXISTING CONDITIONS IN THE BEAUFORT AND CHUKCHI SEA AREAS

A. Natural/Physical Environment

Briefly describe the characteristics of the natural/physical environment in the Beaufort and Chukchi Sea areas that are taken into account during oil exploration, development, production, and transportation as well as during oil-spill response planning and response (e.g., weather, ice conditions, and water depth).

B. Native Interests and Concerns

1. Background Information

a. Demographics

Briefly describe the locations and numbers of Native people who could potentially be affected by an oil spill in the Beaufort and Chukchi Seas. The section should focus on Native people in coastal communities in the North Slope Borough, Northwest Arctic Borough, and the Bering Strait Coastal Resources Service Area (from Cape Prince of Wales north).

b. Subsistence Resources

Briefly describe subsistence resources at risk (e.g., whales, seals, walruses, polar bears, and migratory waterfowl), and generally identify their seasonal distributions. Briefly describe subsistence hunting activities (emphasizing offshore hunting), subsistence regulations (i.e., harvest quotas for bowhead whales) and the importance of those resources to Native people (e.g., food, clothing, crafts, cultural traditions).

2. Native Concerns Regarding Oil Spills and Oil-Spill Cleanup Activities

Briefly describe Native concerns regarding oil spills and oil-spill cleanup activities. Native concerns may include, but are not limited to, potential: disruptions to subsistence activities (e.g., disruptions resulting from noise or the physical presence of vessels or humans); reductions in wildlife populations (e.g., reductions due to alteration of normal distribution patterns or due to wildlife killed by a spill); limitations in access to wildlife resources; contamination of food; and disruption of lifestyles. In addition, the existence and adequacy of emergency relief and general assistance, and Native participation in preparedness and response activities may also be a Native concern.

C. Oil Exploration, Development, Production, and Transportation

1. Canada

Briefly describe the status of Canadian plans for developing the Amalagak field and subsequent transportation of oil produced from the field (identify open-water months when transportation could occur). Also describe other relevant exploration, development, production, and transportation activities associated with Canadian oil fields that could result in a spill that enters the Beaufort or Chukchi Seas.

2. United States

a. Outer Continental Shelf

b. State Waters

c. Onshore (only facilities where oil spills could enter the Beaufort or Chukchi Seas)

Identify and briefly summarize existing and proposed oil exploration, development, production, and transportation activities.

III. EXISTING OIL SPILL MEASURES

A. Oil Spill Prevention

Oil Exploration, Development, Production, and Transportation Regulations and Stipulations

1. Oil Exploration, Development, and Production

Briefly describe Federal, state/provincial, and local regulations and stipulations (in the United States and Canada) for oil spill prevention.

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2. Oil Transportation

Briefly describe United States and Canadian Federal and state/provincial regulations for preventing oil spills associated with oil pipelines and oil tankers. Also briefly describe regulations concerning the location of tanker traffic in the Beaufort and Chukchi Seas, regulations requiring double hulls for tankers, and regulations regarding limits of liability for oil spills from tankers.

B. Oil Spill Contingency Planning/Coordinated Actions

1. Public Sector Contingency Plans

a. International Contingency Plans

i. United States/Canada

ii. United States/U.S.S.R.

iii. International Convention

iv. Arctic Nations Memorandum of Understanding

b. National Contingency Plans

i. Canada

ii. United States

c. Regional Contingency Plans

United States (i.e., Alaska Regional Response Team's contingency plan)

d. State/Provincial Contingency Plans

i. Yukon Territory and Northwest Territory

ii. State of Alaska

e. Local Contingency Plans

i. U.S. Coast Guard Marine Safety Office Plan for Western Alaska

ii. Borough and/or Village Plans

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2. Contingency Plan Requirements for Private Industry

   a. Federal Requirements

      i. Minerals Management Service Requirements for Oil Exploration, Development and Production Activities on the Outer Continental Shelf

      ii. Canada Oil and Gas Lands Administration Requirements for Offshore Oil Exploration, Development, and Production

      iii. Bureau of Land Management Requirements for Oil Transportation through the Trans-Alaska Pipeline

   b. State/Provincial Requirements

      i. Alaska Department of Environmental Conservation Requirements for Oil Transportation and Oil Exploration, Development, and Production on State Lands and in State Waters

      ii. Canadian Provincial Requirements, if Applicable

   c. Local Requirements

      i. North Slope Borough Requirements for Oil Exploration, Development, Production, and Transportation on North Slope Borough Lands

      ii. Northwest Arctic Borough Requirements for Oil Exploration, Development, Production, and Transportation on North Slope Borough Lands (if Applicable)

      iii. Canadian Local Requirements, if Applicable

Each section should briefly summarize contingency planning requirements and any requirements that address Native interests.

3. Private Sector Contingency Plans

   a. Oil Company Contingency Plans for Exploration, Development, Production, and Transportation

b. Oil Spill Cooperatives

i. Alaska Clean Seas

ii. Alyeska Pipeline Service Company

iii. Cook Inlet Resource Organization

iv. Marine Spill Response Corporation

v. Beaufort Sea Oil Spill Equipment Cooperative

vi. Canadian West Coast Cooperative

vii. Canadian East Coast Cooperative

Each of the contingency plans should be briefly described, including resources for containing and recovering discharges of oil. In addition, a summary of any Native involvement in the plan's preparation (if any) should be included as well as how the plan addresses Native interests (if it does).

C. Oil Spill Response

a. Minor Discharge of Oil (i.e., less than 10,000 gallons)

United States

a. Oil Industry

b. U.S. Coast Guard

c. State of Alaska

b. Medium Discharge of Oil (i.e., 10,000 to 100,000 gallons)

i. International (if Applicable)

ii. United States

a. Oil Industry

b. U.S. Coast Guard

c. State of Alaska

iii. Canadian Organizations (if Applicable)

a. Oil Industry

b. Canadian Coast Guard

c. Major Discharge of Oil (i.e., over 100,000 gallons)

i. International

ii. United States

a. Oil Industry

b. U.S. Coast Guard

c. State of Alaska

iii. Canadian Organizations

a. Oil Industry

b. Canadian Coast Guard

This section should briefly describe how a response would be organized and implemented for containing and recovering minor, medium, and major discharges of oil in the Beaufort and Chukchi Seas, and any provisions for Native involvement.

D. Research on Oil Spill Response Technologies for the Arctic

1. International

2. United States

3. State of Alaska

This section should briefly describe existing and planned research on oil-spill response technologies for the Arctic. Approximate funding amounts and sources should also be included.

IV. RECOVERY OF DAMAGES

A. International

Identify and describe any international damage assessment provisions. Describe any provisions that would allow Native people to recover damages from an oil spill.

B. National

Identify and describe the Federal natural resource damage assessment process. Identify and describe any other Federal process(es) that would allow Native people to recover damages from an oil spill.

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C. State of Alaska

Identify and describe the State of Alaska's damage assessment process and any other State of Alaska process that would allow Native people to recover damages from an oil spill.

V. IDENTIFICATION OF ISSUES

A. Contingency Plans/Coordinated Actions

Identify Native issues associated with contingency plans/coordinated actions (e.g., Native involvement in developing and exercising contingency plans; adequacy of the contingency plans).

B. Recovery of Damages

Identify areas within existing damage assessment/recovery legislation where Native interests are taken into account. Discuss provisions for emergency relief.

C. Other Issues

Identify other relative issues.

VI. FINDINGS

A. Contingency Plans/Coordinated Actions

Summarize findings based on information in Sections III and V.

B. Recovery of Damages

Summarize findings based on information in Sections IV and V.

C. Other Issues

Summarize findings based on information in Sections III and V.

Alaska Environmental Lobby, Inc.

P.O. Box 22151 Juneau, Alaska 99802

907-463-3366
Fax 907-463-3312

POSITION PAPER
HJR 36

The Alaska Environmental Lobby supports HJR 36, relating to off-shore oil exploration, development, and tanker transportation activities in the Beaufort and Chukchi seas. The resolution states the following:

1.) **The Alaska State Legislature believes that the oil industry has yet to conclusively demonstrate the ability to adequately respond to, contain, or clean up a significant oil spill in arctic waters under commonly occurring environmental conditions.** The oil industry's incapability was clearly demonstrated in Prince William Sound; the problems faced in the relatively calm waters of the Sound would be magnified in the Arctic seas. In a hearing on this resolution, a resident of Kaktovik told of at least one incident when an oil clean-up training session had been cancelled because it was "too windy".

2.) **The Alaska State Legislature believes that lease sales in the Beaufort and Chukchi Seas must be approached in an extremely cautious way with complete participation by the people residing in the impacted areas who are most knowledgeable about arctic conditions.** Also, in public testimony, several community members from Barrow and Kaktovik supported this resolution describing the unpredictability of the Arctic environment, as well as the effects industry has on marine life and a subsistence lifestyle.

3.) **The Alaska State Legislature believes that the report mandated by Congress, in the Oil Pollution Act of 1990, should be reviewed and an environmental assessment of off-shore industrial operations in the Arctic be conducted before further oil and gas exploration and development activities take place in the Beaufort and Chukchi Seas.** Simply put, not enough attention has been given to Arctic seas and it is only fair that the Arctic is given the same scrutiny as other states before lease sales proceed. Until this is done, the proverbial cart is before the horse.

In conclusion, the resolution emphasizes the need for more research on Arctic conditions, both in terms of oil spill contingency plans and impacts on marine life. The Lobby feels this is an important issue in a state dependent upon oil for revenue. This resolution gives environmental concerns and community involvement priority.

prepared for AEL by Krista Maciolek, 4/26/91.

April 10, 1991

File

Honorable Representative Hudson
Chairman, House Oil and Gas Committee
P.O. Box V
Juneau, Alaska

Dear Representative Hudson,

Enclosed is my testimony before the House Oil and Gas Committee on the teleconference of April 8, 1991. This testimony was requested by Representative Phillips during the proceedings.

Thank you for the opportunity to testify before the House Oil and Gas Committee on this important matter. If I can be of some assistance in the future, please don't hesitate to contact me at the following address.

Respectfully submitted,

Jerry Ivanoff
Board Member, Arctic Marine Resources Committee
P.O. Box 102
Unalakleet, Alaska
99684 (907) 624-3311

Testimony before the House Oil and Gas Committee on a Resolution Regarding Offshore Oil Exploration in the Chukchi and Beaufort Seas

April 8, 1991

Mr. Chairman and Members of this Committee:

My name is Jerry Granoff from Unalakleet, Alaska. I am testifying on behalf of the Arctic Marine Resources Commission, as a member of the board of directors, in support of Representative Maclean's resolution relating to offshore oil exploration and development in the Chukchi and Beaufort Seas. Our board met last week and unanimously supported this resolution.

I should first briefly explain that the Arctic Marine Resources Commission is a newly formed private non-profit corporation whose members are mostly commercial and subsistence fishermen, and subsistence whalers and hunters from the Alaska Eskimo Whaling Commission, the Chukchi Sea Fishermen's Co-op, the Alaska and Inuvialuit Beluga Whale Committee, and the Bering Sea Fishermen's Association.

AMRC's ultimate goal is to protect the marine resources which are critical to the mainly subsistence hunting and fishing economies of our coastal villages. AMRC hopes to provide a structured forum for the

resolution of conflict between local interests and resource development industries in regards to offshore oil development in arctic waters.

It is our opinion that Alaska's Arctic OCS will be the prime target of intense oil and gas development activities in the years to come. In short, we feel as stated by the resolution that these arctic waters of the Chukchi Sea and Beaufort Sea, and other areas of the Bering Sea, deserve the same treatment in the assessment of environmental impacts and in developing prevention and response contingency plans as demanded in other OCS regions of the continental U.S..

Thank you for this chance to provide our view.

STATEMENT OF OLIVER LEAVITT

Good evening. My name is Oliver Leavitt. I am an Inupiat whaling captain and a resident of Barrow, Alaska. I am also the President of the North Slope Borough Assembly and the Vice President of Arctic Slope Regional Corporation.

The questions we are considering here this evening have to do with the use of the Arctic Ocean for the development and transportation of oil and the impact of these activities on our survival as a people.

As a lifelong resident of the North Slope of Alaska, I have witnessed many changes over the last twenty years. Many of these changes -- increased economic opportunity for our people, significantly improved educational facilities and opportunities, and substantially improved living conditions -- have resulted from the discovery and development of the oil resources on the North Slope. We appreciate these changes in our lives that have resulted from oil development on the North Slope.

Prior to the development of the oil resources at Prudhoe Bay, our people were extremely concerned about the effects of oil development on the fish and land wildlife resources on which our people depend. Over the years, we have become convinced that onshore oil and gas development can occur in a manner that does not adversely affect these fish and wildlife resources.

However, our concerns about offshore activities, including oil and gas exploration, production and transportation in the Arctic Ocean, have not been relieved. These activities, using unproven technology and accompanied by insufficient oil spill clean-up equipment, pose a direct threat to our marine subsistence resources.

We have seen our bowhead whales move farther offshore when industrial activity is taking place. We have seen the disastrous consequences of a tanker spill in the relatively calm waters of Prince William Sound, an area free of pack and shore ice.

Far from being convinced that oil can be developed or transported safely in Arctic waters, we remain deeply troubled by the prospect of increased oil and gas activities in the Arctic Ocean. We therefore welcome this study by the United States Department of the Interior and applaud the action of the Congress in directing this study.

As I stated, the discovery and development of oil on the North Slope has brought unprecedented economic opportunity to our people. We also are acutely aware of the importance of these oil resources to our nation and to our national security. However, we must stress the importance of balancing these energy needs against the reality that subsistence hunting continues to provide the principal source of food and livelihood in the majority of our Arctic Native villages.

A substantial portion of our subsistence resources are taken from the waters of the Arctic Ocean. This subsistence hunting, especially the hunt of the bowhead whale, not only provides nutrition to our people, it is the life blood of our living Inupiat culture.

We believe a delicate balance can and must be struck between the competing interests of oil development and the subsistence use of marine resources. However, achieving this balance requires that the exploitation of oil resources in the Arctic proceed according to two fundamental imperatives.

First and foremost, to the greatest extent feasible, oil development and transportation activities should be focused on land rather than in the OCS. Over the past twenty years, we have witnessed an ever-improving ability of the oil industry to explore for and develop oil resources on the North Slope in a manner that does not adversely impact the freshwater fish and the non-marine wildlife resources on which we depend.

We now believe that onshore oil and gas exploration and development can occur in an environmentally sensitive manner. We therefore would urge that oil and gas exploration and development activities be focused onshore rather than offshore in northern Alaska.

We also strongly recommend that transportation of oil and gas resources in the Arctic Ocean be limited to the minimum distances necessary to transport those resources to onshore transportation networks, utilizing the Trans-Alaska Pipeline System or other onshore transportation facilities.

We are all well aware of the risks associated with the offshore transportation of oil. These risks are greatly multiplied when oil is transported through Arctic sea ice. The technology for this type of transportation is unproven and the risks of an oil spill are significant.

Given the very brief window provided by the open water season in the Arctic, any offshore transportation plan ultimately will include transportation through sea ice.

Any spill of crude oil in the Arctic Ocean could devastate the subsistence resources upon which most of our villages rely as their primary food source. As you will come to understand as you listen to the comments made here this evening, even a brief interruption in the availability of these reserves would place many of our villages at serious risk from lack of adequate nutrition.

A clear, simple and acceptable alternative to tankering is provided by over-land transportation systems. Any plan to

transport oil in the Arctic, be it transportation by the United States or by Canada, should be based on the use of an over-land system.

If for any reason an over-land system is not feasible, we strongly urge the use of double hull tankers accompanied by ice breakers and a barge equipped with containment and clean-up equipment. This system should substantially reduce the possibility of a significant and disastrous oil spill.

The second imperative is that, in addition to transportation, any oil exploration or development undertaken in the OCS should occur only in the immediate presence of state-of-the-art containment and clean-up equipment.

We are told that the risks of an oil spill from offshore exploratory drilling are small. Nonetheless, they do exist.

During the gray whale rescue a few years ago, we saw first hand the near impossibility of moving heavy equipment from Prudhoe Bay to Barrow during ice cover. Had this incident been a blowout from an exploratory well, the results could have been disastrous.

The extreme conditions created by Arctic weather and sea ice make it imperative that all companies -- and countries --

operating in the Arctic OCS be required to have response and containment equipment immediately available, and that the available equipment be capable of handling a spill of a worst-case magnitude.

In conclusion, it is our view that the most effective means of dealing with an oil spill in the Arctic Ocean is to keep one from happening. This can be accomplished by confining oil development and transportation to land.

If an offshore spill does occur, from whatever source, whether tankering or drilling and whether the source is under the United States or Canadian jurisdiction, state-of-the-art containment and clean-up equipment must be immediately availabe.

Finally, your study should clearly document the health risks our people face if we are forced to confront a spill in our marine hunting grounds. A contingency plan must be developed for providing adequate food, preferably traditional foods, to our people in the event of a catastrophe.

I hope that these points are of use to you in conducting your study and I thank you for the opportunity to speak to you today. I would be happy to answer any questions that you may have.

Alaska Eskimo Whaling Commission
P.O. Box 570
Barrow, Alaska 99723
Phone: (907) 852-2392

April 2, 1991

Representative Eileen MacLean
Co-Chair House Finance Committee
Box V
Juneau, Alaska 99811

Dear Eileen:

The Alaska Eskimo Whaling Commission supports your resolution relating to off-shore oil exploration, development and tanker transportation activities in the Beaufort and Chukchi seas.

Those who are most affected by industrial activities have been voicing their doubts about the ability of the oil companies to clean and contain an oil spill under Arctic sea-ice conditions. One hunter, in particular, came to ARCO's recent public meeting in Barrow and said he was trained as a local oil spill response team member, but felt that his training was very inadequate and the equipment was insufficient after seeing the amount of equipment used in Valdez.

This is unsettling at best, since our identity as Inupiaq people is so closely tied to our subsistence way of life. If you need any help from AEWC regarding this resolution, please don't hesitate to call. Good luck, and thank you for all that you are doing for us.

Sincerely,

Beverly

Beverly Patkotak Grinage
Executive Director

ARCTIC MARINE RESOURCES COMMISSION
725 Christensen Drive
Anchorage, Alaska 99501

Phone: 279-6519 FAX: 258-6688

April 2, 1991

Representative Eileen MacLean
Co-Chair House Finance Committee
Box V
Juneau, Alaska 99811

Dear Representative MacLean:

The Arctic Marine Resources Commission (AMRC) board met yesterday, and unanimously supported your resolution regarding offshore oil exploration in the Beaufort and Chukchi seas.

Board members of the AMRC are:

Chairman:
Gordon Ito - Chukchi Sea Fishermen's Co-op, Kotzebue
Vice Chairman:
Marie Adams - Alaska/Inuvialuit Beluga Whale Committee, Barrow
Secretary/Treasurer:
Jerry Ivanoff - Bering Sea Fishermen's Association, Unalakleet
Board member:
Burton Rexford - Alaska Eskimo Whaling Commission, Barrow

As you are aware, the main purpose of the AMRC is to provide a structured forum for handling issues that arise between local interests and resource companies targeting oil and gas development in Arctic waters.

We believe your request is critical for the protection of our marine resources, and hope that it passes the Legislature successfully. If you need any assistance from the AMRC, please don't hesitate to call Jon Zuck at 279-6519.

Sincerely,

Beverly

Beverly Patkotak Grinage
for the Arctic Marine Resources Commission

NORTHWEST ARCTIC BOROUGH

P.O. BOX 1110
KOTZEBUE, AK 99752
(907) 442-2500 / FAX 442-2930

April 5, 1991

Rep. Eileen Panigeo MacLean
Rm. 507, Capitol
P.O. Box V
Juneau, Ak 99811

RE: House Joint Resolution No.36 Before the House Special Committee on Oil and Gas, Resources

Dear Ms. MacLean,

The Northwest Arctic Borough has reviewed the joint house resolution introduced by Representatives MacLean, Hudson, Jacko, Koponen, Donley, Finkelstein, Brown, Ivan, Kubina and Ulmer relating to off-shore oil exploration, development, and tanker transportation activities in the Beaufort and Chukchi Seas.

We believe that the oil industry currently does not have the capability to effectively and adequately respond to, contain, or clean up a significant oil spill in arctic waters of the Beaufort and Chukchi Seas, let alone respond to, contain, or clean up an oil spill in the "ice-free" waters of Prince William Sound. Other spills in Cook Inlet and in the continental states along with the example of Prince William Sound, point out the glaring insufficiency and inefficiency of the oil industry's preventative safety measures and responses to spills in warm, ice-free and readily accessible waters.

The Arctic waters in the Beaufort Sea and even-more-so in the Chukchi Sea, breed some of the most inhospitable weather conditions in the world and the industry's oil spill response options for remote arctic waters remain undemonstrated and have been acknowledged by the Alaska Oil Spill Commission, the Arctic Research Commission, and the Minerals Management Service.

There remains no viable late season response options in the event of a well blowout in the late season drilling time table. In the event of a late season blowout, no one can drill a diversion well once the ice pack moves in. The industry and other illustrious dreamers claim that ice-breakers can keep a drill site relatively ice-free to drill, but whose ice breakers, the United States? Our ice breaking capabilities remain something to be desired of, as demonstrated by the two gray whales trapped in the ice off Barrow. An oil spill under these conditions will have multi year devastating effects on the sensitive arctic

environment, wildlife resources, the minute elements of the fragile food chain and the subsistence lifestyles of the Inupiat people.

There exist many unanswered questions and oil spill scenarios to allow additional oil lease sales to occur and yet the distinguished Secretary of the Interior is preparing to offer over 40 million acres in offshore tracts to the oil industry.

We firmly believe that the Secretary of the Interior should not proceed with the planned lease sales in the Arctic until he, the Congress, and the public have the opportunity to review the comprehensive report on the state of oil spill contingency planning in arctic waters. The Oil Pollution Act of 1990, P.L. 101-380, 104 Stat. 484, mandates the Secretary of the Interior to produce such a report no later than May 1991.

In conclusion, the Northwest Arctic Borough fully supports and is in favor of enacting House Joint Resolution No. 36 which would petition the Secretary of Interior to cancel or hold off the planned offshore lease sales in the Arctic until he, the Congress and the public have the opportunity to review the report that was mandated by Congress.

Thank you for the opportunity to respond to a sensible and logical resolution as introduced and referred to the House Special Committee on Oil and Gas, Resources.

Sincerely,

Chuck J. Greene
Mayor

NORTH SLOPE BOROUGH

RESOLUTION SERIAL NO. 12-91

A RESOLUTION SUPPORTING PASSAGE OF A RESOLUTION BY THE STATE LEGISLATURE OPPOSING OFFSHORE OIL AND GAS ACTIVITIES

WHEREAS, Offshore industrial activity presents a grave threat to the arctic marine environment and the Inupiat subsistence culture, and

WHEREAS, it would be of great importance to the North Slope Borough in representing its positions to have a resolution passed by the State Legislature opposing continued offshore industrial activity;

NOW THEREFORE BE IT RESOLVED:

The North Slope Borough Assembly supports passage of the attached resolution introduced by Representative Eileen MacLean and co-sponsored by others by the Alaska State Legislature.

INTRODUCED: April 2, 1991

ADOPTED: April 2, 1991

PRESIDENT
Date: 4-2-91

ATTEST:

CLERK
Date: 4-3-91

MAYOR
Date: 4-3-91

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ARCO Alaska, Inc.
Legal
Post Office Box 100360
Anchorage, Alaska 99510
Telephone 907 265 6549

Antoinette M. Tadolini
Senior Attorney

April 5, 1991

William W. Fox, Jr.
Assistant Administrator for Fisheries
National Marine Fisheries Service
1335 East-West Highway
Silver Spring, MD 30910

Re: Application for Letter of Authorization for Activities Associated with the Cabot Project (Fall, Winter 1991-92) Pursuant to 50 CFR §228.31, et seq.

Dear Mr. Fox:

Pursuant to 50 CFR §228.31, et seq., and consistent with the Joint Petition to Amend Regulations Governing the Taking of Marine Mammals Incidental to Oil and Gas Exploration Activities in Alaska, which was noticed on March 28, 1991 at 56 Federal Register 12881, ARCO Alaska, Inc. ("ARCO") hereby applies for a Letter of Authorization for the take by harassment of bowhead whales, gray whales, beluga whales, bearded seals, ringed seals, and spotted seals incidental to the oil and gas exploration activities to be conducted at the location of the Cabot Project. The exact location of the Cabot Project is 71° 19', 26.4" North latitude and 155° 12', 50.4" West longitude as shown on the map designated as Exhibit A. ARCO believes that its activities, because of the timing and design, will not result in any takings of marine mammals or interference with whaling. Therefore, this application is not an admission by ARCO that any incidental takes of any of these marine mammals will occur or have occurred, nor does it constitute a waiver

by ARCO of any position it may take that no incidental takes have occurred or will occur in the course of its Cabot Project. This application is being filed to avoid claims by others that ARCO is engaging in unauthorized takings.

1. Description of Activity

The Plan of Exploration for the Cabot Project will be submitted to the Minerals Management Service by May 1, 1991. The Cabot Project will be drilled using the Canmar SSDC/MAT, which is described in the brochure enclosed as Exhibit B. It may be necessary to perform approximately two days of site clearance work during the open water season to ensure a stable base for the SSDC/MAT. In general terms, the CANMAR SSDC/MAT will be towed from the Fireweed Project location commencing on or about August 15, 1991, and should arrive at the Cabot Project location 2-3 days thereafter or by August 18, 1991. The tugs towing the SSDC/MAT will depart immediately after positioning the structure, estimated to take approximately two days. The SSDC/MAT will be on stand by status during the remainder of the open water season. There will be no drilling during the bowhead whale migration. Drilling will commence after ARCO is notified by NMFS that the bowhead whale migration has been completed and will be conducted during the winter. The SSDC/MAT will be demobilized during the summer of 1992.

2. Measures to Ensure Availability of Species for Subsistence

Because of timing, the Cabot Project will not interfere in any way with the bowhead whale migration or with the Fall subsistence hunt by the community of Barrow. Notwithstanding this position, ARCO has undertaken substantial efforts to inform the community of its plans and will undertake measures to minimize any potential impact. Enclosed as Exhibit C, Plan of Cooperation is a detailed description of these contacts and ARCO's intended activities to keep the community informed of its activities.

In addition, ARCO intends to initiate discussions to negotiate a Communications and Avoidance Agreement with the Alaska Eskimo Whaling Commission (AEWC). ARCO submits that these activities comply with 50 CFR §228.36, without waiving its position that such compliance is unnecessary in the absence of any interference with the subsistence hunt. These actions are not intended to nor should they be construed to waive ARCO's position that the Cabot Project will not interfere in any way with the subsistence hunt.

As a demonstration of ARCO's commitment to minimize possible interference with the subsistence whale hunt or the bowhead whale migration, the supplying of the SSDC/MAT will be done at its present location, the Fireweed #1 site. Approximately half of the materials required for the Cabot project will be supplied by a barge included in the Spring Barrow resupply and the remainder will be barged from Prudhoe Bay before the mid-August SSDC/MAT being moved from the Fireweed site. This early outfitting will assure our being on site and fully provisioned well in advance of the Fall bowhead whale migration.

3. Monitoring Plan

ARCO will conduct a bowhead whale monitoring program during the Fall 1991 migration. This research program, which has been designed in conjunction with and approved by NMFS and the North Slope Borough, is described in detail in Exhibit D. This research program will also detect the presence of other marine mammals throughout its duration.

ARCO believes that there will be no takes by harassment of bearded, ring, or spotted seals incidental to the Cabot Project. Without waiving that position, ARCO will gather data on the presence of seals, if any, in the vicinity of the SSDC/MAT in conjunction with the polar bear monitoring plan which will be submitted to the U.S. Fish & Wildlife Service and the Alaska

Department of Fish & Game (Exhibit E) for approval. The polar bear watch, who will be an appropriately qualified observer, will be instructed to observe and record any seals sighted during the regular patrols maintained for polar bear sighting.

These results of the bowhead whale research program and records of the presence of other marine mammals will be forwarded to NMFS in compliance with the monitoring requirements of 50 CFR § 228.37.

Based on this application and the enclosed Exhibits, ARCO requests that NMFS issue a Letter of Authorization for the Cabot Project.

Please contact the undersigned at (907) 265-6239 if you have any questions or require any additional information.

Sincerely,

Robert R. Griffeth

Robert R. Griffeth
Senior Consultant - Offshore

enclosures

cc: Ron Morris, Western Alaska Manager, NMFS

amt\fox.ltr

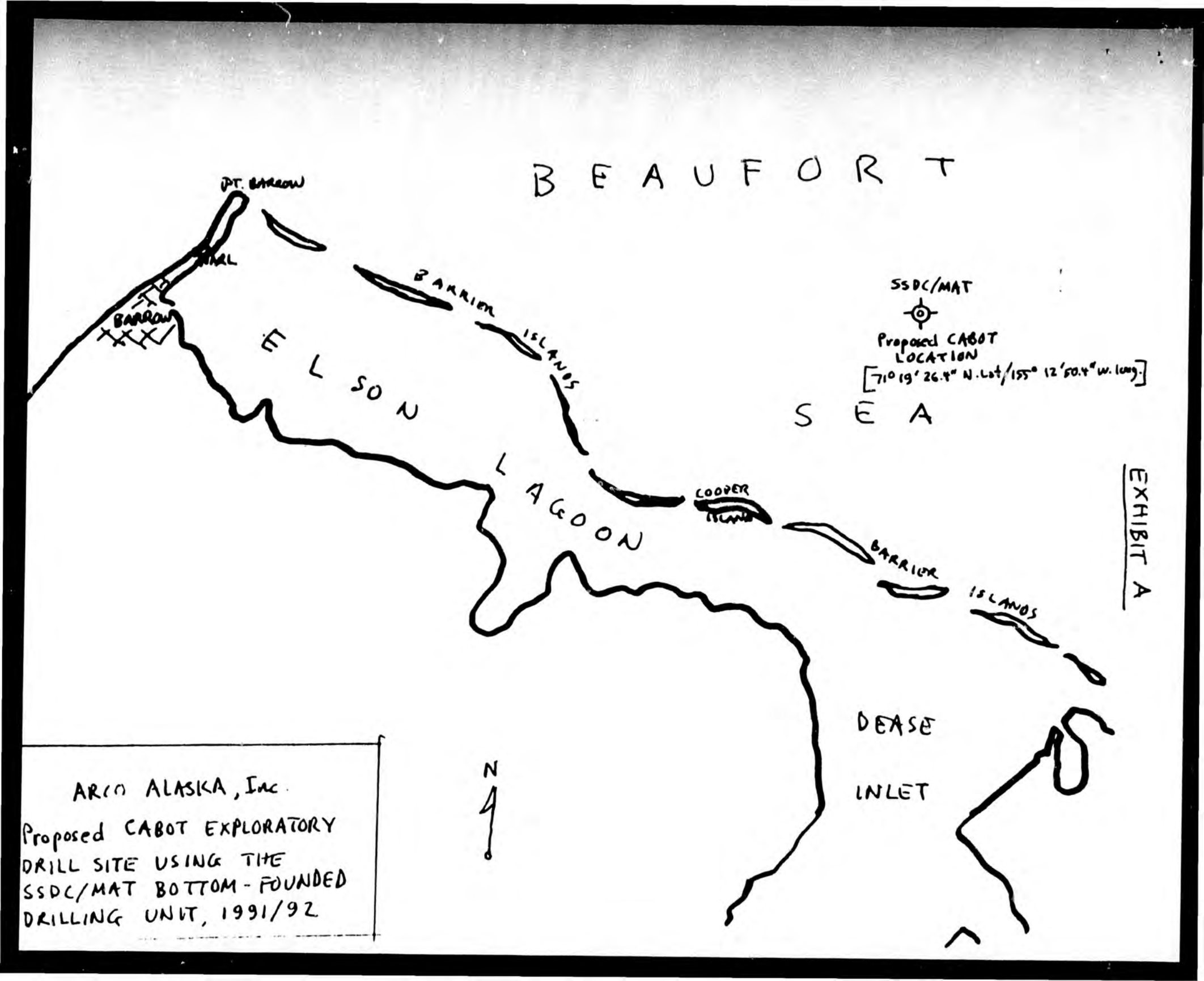
BEAUFORT
PT. BARROW
BARROW
BARRIER ISLANDS
ELSON LAGOON
SSDC/MAT
Proposed CABOT LOCATION
[71° 19' 26.4" N. Lat/155° 12' 50.4" W. Long.]
SEA
COOPER
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EXHIBIT A
ARCO ALASKA, Inc.
Proposed CABOT EXPLORATORY DRILL SITE USING THE SSDC/MAT BOTTOM-FOUNDED DRILLING UNIT, 1991/92

EXHIBIT B, 1

ARCO Alaska, Inc.
Box 100360
Anchorage, AK 99510

CABOT #1 EXPLORATORY WELL PROJECT, BEAUFORT SEA, 1991/1992

PROPOSED PROJECT: ARCO Alaska proposes to conduct an exploratory oil and gas drilling program on a lease located approximately 30 miles east from Barrow and 15 miles north from Dease Inlet (see attached map). The project would use CANMAR's mobile, bottom-founded drilling unit named the SSDC/MAT (which is presently warm-stacked at the Fireweed #1 exploratory well location 16 miles northeast offshore from Camp Lonely). The program would last from open-water, 1991 until the SSDC/MAT could be towed to a different and as yet undetermined location in the summer of 1992.

TIMING: Most open-water activities associated with the proposed Cabot program would consist of towing the unit to and from the location. Many of the items required in a resupply operation will be brought from Prudhoe to the SSDC/MAT at the Fireweed location prior to the tow. As a result, very little surface vessel traffic will be needed at the Cabot site and quite likely none during the fall bowhead migration. The tow to location would occur as soon after the ice has cleared as possible, or approximately early August. All other trips to the unit would be made by helicopter and those trips would be confined to an operationally necessary minimum (crew shift changeouts, fresh food supplies, etc.) during the fall bowhead migration and subsistence hunt. The same timing is proposed for relocating or moving the drilling unit in 1992 at the completion of the project.

BOWHEAD WHALE FALL M IGRATION MONITORING PROGRAM: On the Cabot project, ARCO proposes to continue into its third year a site specific passive acoustical monitoring program. This program was begun in 1989 at the Stinson (west Camden Bay) exploratory location and continued into 1990 at the Fireweed (west Harrison Bay) site. Dr. John Hall and his team of marine mammal scientists and acoustical analysis specialists conducted these studies and have produced two reports which clearly demonstrate that the drilling units (the CIDS and the SSDC/MAT) provided exceptionally good platforms from which to observe and record the reactions of bowhead whales to drilling rigs operating at idle. Recordings of the source sounds produced by the CIDS and SSDC at idle were made. Calculations of transmission losses from the source to points of reception located at various distances from the rigs were also made.

The conclusions drawn from these two studies are that bowheads do not react negatively to the presence of bottom-founded drilling units which lie within the pathway of the fall migration although the units do produce some levels of sound above ambiant even at idle. At both Stinson and Fireweed, small groups of bowheads approached and swam by the rigs. These whales were recorded both acoustically during periods when they were calling and visually by observers aboard the drilling units. Since ARCO does not intend to commence actual drilling operations at the Cabot location until the 1991 migration and fall hunt has been declared over by NMFS and the AEWC, we believe that there is a very low probability that the presence of the SSDC/MAT operating at idle will adversely affect the fall migration or whaling crews ability to conduct the subsistence hunt.

At the same time, ARCO intends to sponsor this third year of effort in order to address a number of intriguing questions raised by both its earlier studies and those conducted by the NSB, AEWC, and other research groups. Many of these questions derive from the recording of bowhead calls during the fall migration, such as comparison of them to the spring calling activity as the whales migrate past Barrow from late April to June and why fall calling activity under open water conditions occurs primarily at night. Others dimensions of the scientific program speak to basic questions such as group size and composition, reidentification of individual animals, patterns of

EXHIBIT B, 2

distribution and abundance in known and frequently used bowhead habitat, such as that represented by the actual Cabot proposed location.

An allied range of questions to be addressed focuses specifically on source sounds produced under actual drilling conditions. These measurements will be taken after the migration, when drilling actually begins, and will be conducted when a safe surface ice condition is present (approximately mid-November). A major purpose of this component of the Cabot monitoring study is to test the hypothesis first developed from the recordings acquired from the CIDS in the Stinson acoustic work that a very significant proportion of actual drilling sounds (perhaps 90%) falls within the infrasonic (or very low frequency) ranges. Only when high fidelity infrasonic recordings are made can they be used in other study programs to measure bowhead responses, if any, to them.

Finally, the Cabot monitoring program will include an aerial observation component. The purpose of this addition is to detect and observe the reactions of bowhead whales before, during and after they enter an assumed zone of influence produced by the SSDC operating at idle. In other words, the aerial observations are meant to be a scientific check on what has been previously observed at Stinson and Fireweed in which observers on the drilling platform detected no apparent avoidance responses among the whale groups sighted where some approached within as close as 100 meters to the units.

OIL SPILL CONTINGENCY PLANNING AND PREPAREDNESS: Over the past two seasons where ARCO has operated offshore drilling programs in the Beaufort Sea, a number of substantial advances have been made in the area of oil spill planning and preparedness. These advances have depended not only on the acquisition of high quality response equipment in adequate quantities and a thorough and continuing training program of rig personnel who will act as the immediate response team, but critically upon the training and organization of village response teams in Nuiqsut, Kaktovik, and Barrow. The thirty some individuals who have received this training (many of whom have participated in drills and demonstrations at ARCO's offshore exploratory locations) will continue to receive training up-date courses in order to maintain their certificates. In fact, many village team members are currently in the process of becoming integrated to the newly reorganized North Slope spill response organization, Alaska Clean Seas. From ARCO's perspective, one of the highest values it has received from its work with the village response teams is the advice its members have given on environmental conditions, sensitive areas and coastlines, wildlife resources, and cultural and subsistence sites and activities. This advice has truly improved and rendered more realistic spill response preparedness. This will be no less the case with the Cabot project where the Barrow team's advice, in particular, is crucial.

NORTH SLOPE RESIDENT HIRE: ARCO is proud of the record it has acquired in the aggressive recruitment and employment of North Slope residents on its offshore projects at Stinson and Fireweed. On the Stinson project a third of the drilling crew were Alaska North Slope Natives. Although the Fireweed drilling program was of shorter duration, a nearly equal number of Native hires were employed in the drilling phase of that project and others continue to remain employed during the current warm-stack phase of the operation. ARCO and its contractors plan to continue the practice of making jobs available to local people since they have found both a wide range of appropriate skills and high caliber employees in Slope communities.

PLANS OF COOPERATION: Even before Plans of Cooperation were required by Federal incidental take regulations, ARCO made it a point to maintain regular communication with North Slope villages so that members of their communities could be informed of ARCO's operating plans and be given the chance to comment and advise on them. These contacts have taken various forms from the Oil/Whalers Cooperative Program and radio communication system to formal informational meetings and informal gatherings such as community-wide suppers. While there is no specific design of a plan of cooperation, ARCO fully intends to continue the pattern of

EXHIBIT B, 3

communication it has established with those villages potentially influenced by its operations on a regular informal basis.

CONTACTS AND SOURCES OF INFORMATION: You may be interested to know that the Alaska Oil and Gas Association (AOGA) has created a new committee called the Alaska Arctic Offshore Operators Committee (AAOOC). The purpose of this committee is to exchange information among industry operators on their plans, projects, and operations and in so doing to provide a single source to which members of the public can turn to find out what various companies are either proposing or are doing in the Beaufort and Chukchi offshore lease areas. The person to whom you should address any inquiries is Mr. Bill Hopkins, Executive Director, Alaska Oil and Gas Association, 121 West Fireweed Lane, Suite 207, Anchorage, AK 99503-2035, Tel. (907) 272-0347.

For specific contacts within ARCO Alaska, Inc. on information about the Cabot project, call
Don McKelvey, New Ventures Drilling Superintendent, (907) 263-4609
Steve Porter, Permits Manager, (907) 265-6269
Bob Griffeth, Environmental Dept., (907) 265-1551

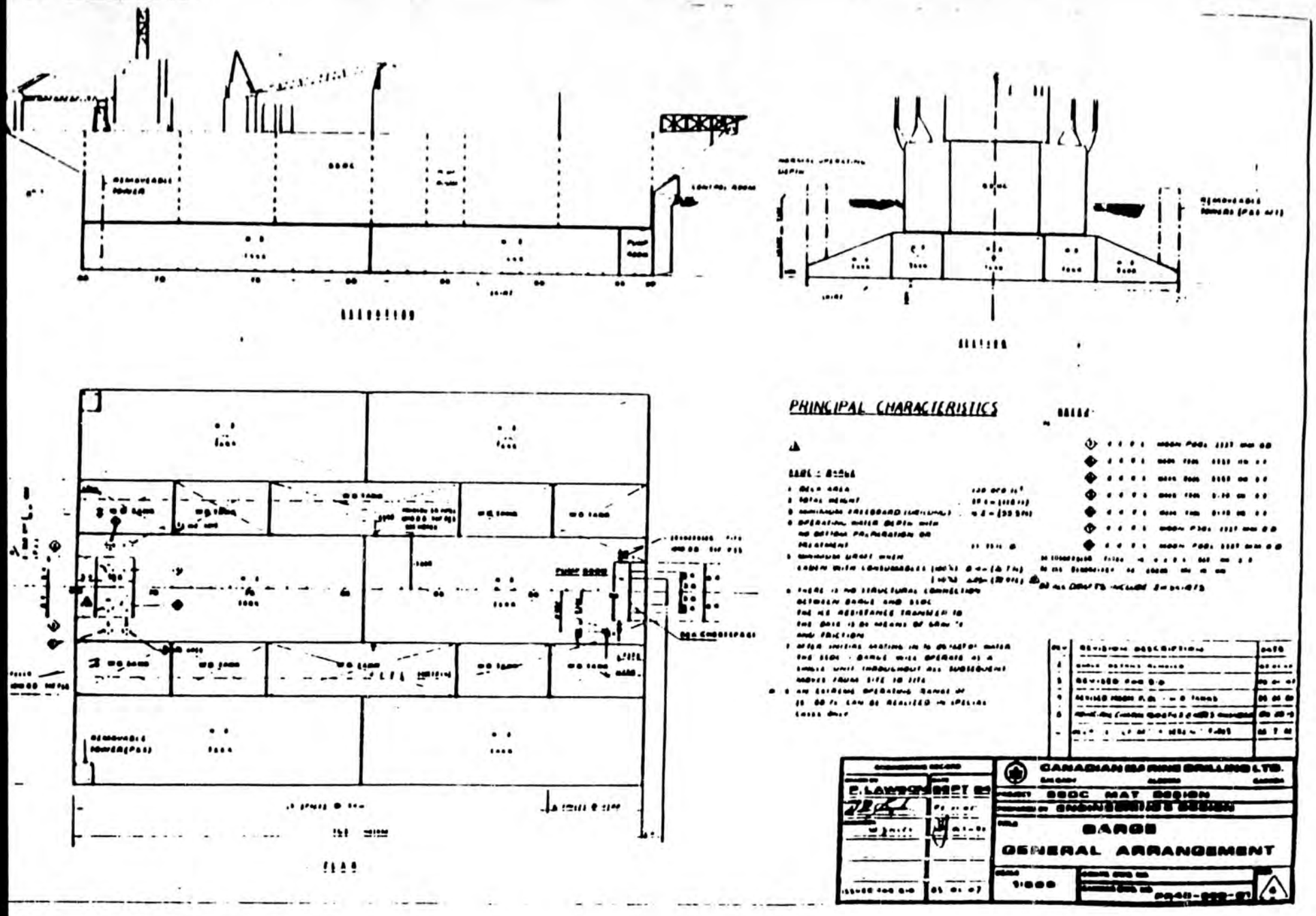

EXHIBIT B, 4

FIGURE 2-1 GENERAL SSDC/MAT CONFIGURATION

EXHIBIT C, 1

ARCO Alaska, Inc.
Box 100360
Anchorage, AK 99510

PLAN OF COOPERATION with Beaufort Sea bowhead whaling communities of Barrow, Nuiqsut and Kaktovik in connection with ARCO Alaska's proposed offshore oil and gas exploration program at the Cabot location, 30 miles offshore east from Barrow, Alaska and 15 miles offshore north from Dease Inlet, 1991-1992.

ARCO initiated its Plan of Cooperation with the Inupiat whaling communities on 8 March 1991 when it met with the Barrow Whaling Captains' Association to discuss its proposed Cabot exploratory program (see Attachment 1, program description). Various ideas and suggestions were put forward by the Barrow whaling captains designed to improve the quality of the required marine mammal monitoring program. Among these suggestions was one that requested ARCO to begin the monitoring program during the last open-water days of the annual fall bowhead migration in order that the monitoring study results might incorporate a behavior/noise disturbance component under actual drilling conditions. While this suggestion is being seriously considered by ARCO, a cautious approach is required since it appears that a consensus is lacking among the whaling captains as to the advisability of conducting actual drilling operations when whales are expected to be within the exploratory project vicinity. The other recommendation from this meeting was that ARCO conduct a public meeting in Barrow where all members of the community would be invited to attend and express their views and concerns on the project.

The Barrow community meeting was held on the evening of Wednesday, 20 March, at the elementary school multi-purpose room. It was widely advertised on KBRW and the local cable television channel. The proceedings were broadcast in full by KBRW. The meeting began at 7:30pm and continued past midnight thus allowing all who wished to do so to comment in both Inupiaq and in English. More than 20 whaling captains, city and Borough officials, and local residents made oral comments. ARCO was represented by its vice president for exploration, J. Dees, and members of its drilling, permitting, and environmental departments. ARCO's main contractors for the proposed Cabot project--CANMAR Drilling, Arctic Catering, and Piqniq Corp.--also sent representatives.

ARCO's brief opening presentation closely followed the project description contained in Attachment 1. The timing, duration, and specific activities associated with the Cabot project were highlighted. The elements of the proposed marine mammal monitoring program were described including the fact that the monitoring program will be fully developed through consultation with the North Slope Borough's Department of Wildlife Management. A description of the North Slope village (including Barrow) Oil Spill Response Teams was given. And, ARCO's commitment to continuing its program of North Slope resident hiring of project personnel was reemphasized.

The balance of the meeting was then devoted to comments by the Barrow community. While many of these comments covered areas that were not necessarily directly linked to the proposed Cabot exploratory project, most were. Broadly, these comments touched on the following areas:
(1) The nature of the marine mammals monitoring program to be conducted under a Letter of Authorization required by the new incidental take rules.
(2) ARCO's oil spill and blowout prevention preparedness and response capabilities.
(3) Mitigation measures planned to address potential environmental and socio-economic impacts.
The only formal written statement was provided by Burton Rexford, Chairman of the Alaska Eskimo Whaling Commission (Attachment 3). The AEWC's statement covered the majority of concerns raised by other speakers. However, a detailed response to specific questions and concerns raised by all speakers is included as Attachment 2. This response is being sent to appropriate community agencies and residents.

EXHIBIT C, 2

Meetings are being scheduled for mid-April with the community and whaling captains' associations in Nuiqsut and Kaktovik. The proposed Cabot project will be presented and community comments invited.

Should an Oil/Whalers Agreement be developed for the 1991 season between oil industry offshore operators and the whaling captains' associations of Nuiqsut and Kaktovik (as administered through the AEWC), ARCO will become a participant.

ARCO and representatives of its contractors will also to continue to make available information about opportunities for employment on the Cabot project. Piqniq Corp. will serve as the principal point of contact for completing the screening and hiring procedures. However, in-village visits will be made by ARCO and contractor representatives to insure the maintenance of their on-going resident hire programs.

As it has in its 1989 and 1990 offshore exploratory programs, ARCO will continue with its training program of the Village Oil Spill Response Teams in Barrow, Nuiqsut, and Kaktovik. Refresher and up-grade courses will be given in conjunction with the Alaska Clean Seas program for North Slope Village Response Teams. Representative OSRT members from the villages will also be invited to participate in spill response exercises and demonstrations at the Cabot location. In this manner the village communities can receive up-to-date information on the exploratory project as it progresses from those residents who serve on the OSRT's.

EXHIBIT C, Attach. 1, 1

1 April 1991

TO: Alaska Eskimo Whaling Commission - Barrow, AK
Barrow Whaling Captains' Association - Barrow, AK
North Slope Borough - Barrow, AK
Office of the Mayor
Department of Wildlife Management
Planning Department
Office of the Mayor - Barrow, AK
Ukpeagvik Inupiat Corp. - Barrow, AK
All Interested Barrow Community Residents

FROM: ARCO Alaska, Inc.
Box 100360
Anchorage, AK 99510
Contact Tel. (907) 265-1551 [Bob Griffeth]

SUBJECT: ARCO's Responses to Questions, Comments, and Concerns Raised by Residents and Officials of the Barrow, Alaska Community Regarding the Proposed Cabot Offshore Oil and Gas Exploratory Program (1991/1992) as Stated at the Community Meeting Held on 20 March 1991 in Barrow.

ARCO wishes to thank the various members of the Barrow community who took the time and effort to comment on its proposed Cabot exploratory project at the meeting held at the Multi-Purpose Room of the Elementary School on the evening of 20 March. ARCO recognizes that the Cabot project is proposed for a location of special interest and concern to Barrow whalers in that exploratory activities will be conducted in an area where the fall bowhead migration normally occurs. For this reason ARCO wishes to make a determined effort to conduct an environmentally safe program, in cooperation with Barrow, that will directly address community concerns and incorporate recommendations made by community residents.

We believe we do have the experience and technical capability to schedule and carry out an exploratory drilling program that will not cause adverse impacts on the bowhead migration and subsistence whaling activities. We also believe that the marine mammal monitoring program proposed for Cabot has the prospect of further enriching scientific knowledge of both bowhead ecology and offshore industrial activities that could conceivably influence it. Beyond that, ARCO believes that the preparedness measures it has taken to handle events such as an oil spill are sound ones that go to the heart of many of the concerns expressed at the community meeting.

Nearly all members of the AEWC, Barrow Whaling Captains' Association, NSB and Barrow city governments, and local Native corporations and organizations (including ICAS) who gave comments covered three broad areas: (1) Potential impact of the Cabot program on the bowhead migration (fall and spring) and the NMFS supervised marine mammal monitoring program specifically designed to address that matter ; (2) The technical capacity of the offshore operator to contain and clean up spilled oil in Arctic conditions of sea ice cover at the drilling location; (3) Socio-economic and cultural impacts on the Barrow community. These three main topics were elaborated on by various other commentators who were not necessarily officially associated with the whaling organizations, local government representatives, or Native organizations.

In what follows ARCO wishes to respond to the points raised by each of the 21 speakers who made comments, but will do so here by treating the three broad topics in detail. The names of individual commentators who best summarized a specific question, comment, or concern will be mentioned as appropriate.

EXHIBIT C, Attach. 2, 1

ARCO Alaska, Inc.
Box 100360
Anchorage, AK 99510

ARCO's RESPONSES TO QUESTIONS, COMMENTS, AND CONCERNS RAISED BY BARROW RESIDENTS REGARDING THE PROPOSED CABOT #1 EXPLORATORY WELL PROJECT, BEAUFORT SEA WESTERN LEASE AREA (1991/1992)

TOPIC I: Potential Impact of the Cabot Program on the Bowhead Migration (Fall and Spring) and the NMFS Supervised Marine Mammal Monitoring Program Specifically Designed to Address That Matter.

Nine commentators [B. Rexford, E. Brower, E. Itta, D. Rexford, R. Brower, J. Adams, Arnold Brower, Jr., Tom Lohman, and Tom Albert] directed their comments and concerns to this important topic. In general they requested that ARCO follow faithfully the newly stated NMFS guidelines for site specific monitoring and that the Barrow community be given the opportunity to comment on the program ARCO will propose for monitoring.

ARCO response: ARCO has drafted its site specific marine mammal monitoring program at the Cabot location in accordance with the NMFS issued guidelines that resulted from a joint agency/industry workshop held last February in Seattle. Beyond that, ARCO has already begun consultations with the NSB Wildlife Management Dept. in drafting the monitoring proposal and intends to work closely with that department, AEWC, and the Barrow Whaling Captains Association as well as with the two principal Federal oversight agencies (NMFS and MMS) as it develops the detailed monitoring methodology and accompanying science program. Since the monitoring program is also submitted as an essential component of ARCO's application for a Letter of Authorization (LOA) from NMFS under the Incidental Take of Marine Mammals Regulations, there will be further opportunities for members of the Barrow community to comment. In effect, ARCO is anxious to have the continued input from the Barrow community in order to make its monitoring effort a good one.

Various speakers [T. Albert, T. Lohman, E. Itta, A. Brower and others] took note of the fact that the monitoring program, while heavily focused on bowhead whales, must also include monitoring for five other species: grey and beluga whales, bearded, ringed, and spotted seals. This feature is definitely included in ARCO's draft monitoring proposal. Monitoring activity will be conducted in three ways (by aerial, visual--from the drill platform--and acoustic methods) all of which are appropriate to sightings and behavioral observations of five of these species (bowhead and beluga whales and the three seal species). The sixth species, grey whales, will be monitored aerially and visually; but, unlike the other whales and seals, this class of cetaceans does not engage in the vigorous calling activity characteristic of the other five species so that acoustic monitoring is likely to produce meagre, if any, results.

Some speakers [see particularly B. Rexford's written comments on behalf of the AEWC] expressed the concern that the Cabot location lies so clearly within the usual bowhead migratory pathway that operations there might have an adverse impact on the fall subsistence hunt. ARCO has scheduled its summer/early fall 1991 operations to minimize that possibility. We believe that knowledge and experience gained from the Stinson and Fireweed programs of 1989 and 1990 with the drilling units operating only in warm standby mode (no drilling) and minimum surface vessel and aircraft traffic to the units during the migration produced no identifiable blockage of the migration or displacement of whales seaward, away from the rigs. In fact, during both previous programs some whales appeared to actually alter their westward swim orientation to approach within very close proximity of the rigs. These interactions are reported in detail in the monitoring program studies produced by Dr. John Hall, the principal scientific investigator, and are available in the offices of AEWC, NSB Wildlife, and NSB Planning. In any case, ARCO's proposed

operations at the Cabot location will conform to the request, again expressed in the AEWC statement, that no drilling or surface vessel traffic will be conducted during either the fall 1991 or the spring 1992 bowhead whale hunt by Barrow whalers; and, only the operationally necessary minimum helicopter flights will be flown during those same periods of the hunt.

Speakers J. Adams and E. Brower brought up a matter which had previously been discussed at the 8 March meeting between ARCO and the Barrow Captains: that is, when and if Barrow acquires its bowhead quota and declares the hunt over before the end of the migration, then the monitoring program should begin under real-time drilling conditions. Both speakers hold the view (which was also generally agreed to by the majority of whalers at the 8 March meeting) that only when a realistic study under actual operating (drilling) conditions occurs will we be able to determine what, if any, responses bowheads demonstrate to that offshore industrial marine noise source. In this regard E. Brower stated that "we don't want any more bogus studies that don't give us any believable answers." ARCO is receptive to this request for a real-time monitoring study component but would ask that all interested parties (AEWC, NSB agencies, etc.in addition to the Barrow Captains Assoc.) in the Barrow community reach formal agreement on the matter and express that agreement in writing to ARCO. This agreement would be a necessary attachment to ARCO's application for the Incidental Take LOA being sought from NMFS as well as waiver of stipulated requirements imposed by the MMS regarding the specific time at which a drilling program can commence. There are other operational considerations which also influence ARCO's ability to respond to this request to commence actual drilling at the tail end of the bowhead migration that are, generally, associated with NSB, State and Federal seasonal drilling restrictions. However, ARCO is willing to explore these matters in order to respond positively to the Barrow Whaling Captains' Association request.

To summarize the response to questions, comments and concerns which Barrow residents have raised on this topic, ARCO as operator of the proposed Cabot project exploratory drilling program will follow the NMFS guidelines in carrying out the marine mammals monitoring program; will continue consultations with appropriate Barrow and NSB organizations to produce sound methods and scientific procedures for that program; will schedule its operations in a fashion that is expected to produce little or no adverse impact on the fall and spring bowhead whale hunts; and will make efforts to consult with all appropriate parties on the request by Barrow whalers to conduct a portion of the monitoring program under real-time drilling conditions at the conclusion of the fall 1991 hunt but before the migration has ended.

TOPIC II: ARCO's Technical Capacity to Contain and Clean Up Spilled Oil in Arctic Conditions of Sea Ice Cover at the Cabot Drilling Location, Relief Well Plan, and Other Environmental Protection Measures.

In the course of acquiring permission to operate, ARCO is required to prepare, among other things, (1) An approved Oil Spill Contingency Plan covering response techniques to be employed under all potential environmental conditions (open water, broken ice, and solid ice); (2) A Relief Well Plan in the event an uncontrolled blowout of oil occurs; and (3) Permits to discharge non-harmful materials such as muds, cuttings, and treated water into the marine environment. Many individuals who gave statements at the 20 March community meeting touched in varying degrees on all three of these subjects. However, principal concern focused on the plan and techniques to be employed in cleaning up spilled oil should it be released under the ice. This is a particularly apt concern since the Cabot drilling program is scheduled as a winter activity during solid ice cover at the location.

ARCO's responses: (1) The issue of the ability to contain and clean up oil spilled under the ice was first and most thoroughly stated by E. Hopson. Mr. Hopson commented that under ice water currents move at roughly the same speed as a person walking and would therefore likely transport oil spilled under the ice at the same rate. He went on to inquire whether adequately trained

personnel and equipment could effectively deal with such a situation. Many other speakers addressed the same issue. These included B. Rexford (see written statement), NSB Mayor J. Kaleak, A. Akpik (representing Barrow City Mayor D. Long), D. Rexford, B. Adams, W. Ahmakak, and D. Nungasak. Other speakers also alluded to this topic including oil spill clean up capabilities for open water and broken ice conditions.

ARCO believes that prevention preparedness is the best way to address this issue. It has gained considerable offshore experience in the projects it conducted in 1989 at Stinson and 1990 at Fireweed locations.This experience prominently includes training and equipment acquisition, on site, to contain and clean up spills including those which might be entrained under ice. A substantial number of rig crew personnel have received both the basic and specialized courses that focus on prevention and response. In addition, drills and exercises are regularly conducted to insure each response team member understands his or her responsibilities and that the clean up equipment is in good working order for Arctic conditions. Beyond that, the Nuiqsut, Kaktovik and Barrow oil spill response teams (10 members each) have received the basic OSRT course and will continue to receive refresher and up-date training with special attention to spills on or under sea ice. The Nuiqsut and Kaktovik teams have been represented on drills and exercises at Stinson and Fireweed, and two Barrow team members participated in an early winter exercise at Fireweed (see specific response to comments by D. Nungasak, Barrow OSRT member, below). These preparedness measures are dealt with in considerable detail in the Cabot Oil Spill Contingency Plan, copies of which will be made available to appropriate agencies in the community and which may be consulted by any interested resident.

Barrow whaling captain and OSRT trainee D. Nungasak reported that he felt his training, in Barrow along with other members of the fire department, was incomplete. He is correct. The 40 hour training course given in August 1990 covered the basic materials in a classroom setting (which included a 24 hour hazardous materials component). Bad weather prevented carrying out the field/hands-on component of OSRT training at that time. Such training is scheduled for the Barrow OSRT trainees and may be conducted in conjunction with Alaska Clean Seas courses which also focus on response training appropriate for villages, the existing oil fields and, to some extent, offshore operations. Nungasak also participated as an observer at the Fireweed project spill training exercise but expressed his disappointment that no on-ice training occurred there. Very dynamic ice conditions provided the scenario for that exercise and approval was given by the inspecting regulatory agencies that ARCO had adequately demonstrated its response capacity. Even so, no response personnel or equipment were deployed onto the sea ice on that occasion, a matter which is unlikely to be repeated at the Cabot prospect where much earlier stable shorefast ice formation is likely to occur and which will enable OSRT training and demonstration exercises to be held safely on the sea ice.

However, ARCO believes that interested community members in Barrow deserve a much more detailed technical explanation of how it, as operator, would respond to a spill on or under sea ice. For that reason *ARCO proposes to hold a seminar/workshop on Arctic offshore containment and clean up measures, in Barrow, at a time and place deemed suitable (perhaps mid-April) by the NSB Planning Department. Residents, NSB and City, and Native organization representatives will be invited to attend the seminar/workshop*.

(2) Every offshore drilling exploration project requires an approved plan for drilling a relief well in the event of a blowout with uncontrolled release of oil. Under Arctic winter conditions this naturally requires logistic preparations to transport a relief drill rig to an appropriate location. In the case of the SSDC/MAT drilling unit which is proposed for use on the Cabot project, a second drill site aboard the unit can be equipped to drill the relief with a rig transportable by helicopter. One advantage of the Cabot location is that adequate near-site logistic back-up infrastructure is available in Barrow. Details of the relief well plan can be consulted in documents filed with the MMS and the NSB.

(3) Two speakers (see AEWC statement by B. Rexford, for example) asked questions and raised concerns about discharges from the drilling unit made into the marine environment. In particular, the question was asked whether harmful materials might be introduced that would impact the marine food chain. The straight-forward answer to this question is that no waste materials (solid or liquid) containing substances potentially harmful to marine organisms or humans may be discharged into the ocean. Such liquid or solid materials as are normally discharged into the sea (muds and cuttings from the drilling operation and treated waste water from the SSDC's life support systems) are very carefully monitored and regulated by the EPA and other agencies which must certify that such material will cause no adverse environmental consequences. The regulations allow for no exceptions to this high standard. The Cabot project would be in violation of the law if its operations were to result in any unpermitted or potentially harmful discharge.

TOPIC III: Socio-Economic and Cultural Impacts of the Cabot Project on the Barrow Community. Numerous speakers centered their comments around the subject of oil development's impacts on Inupiat culture, society, and economy . In each instance the central role of subsistence was stressed. Among the speakers who directed their remarks to these subjects were B. Hugo, D. Rexford, K. Toovak, Sr., N. Itta, A. Brower, Jr., and J. Brower. Other comments were received from NSB Mayor J. Kaleak and Barrow Mayor D. Long (in a statement given by A. Akpik) regarding local hire of NSB residents. R. Brower speaking as president of UIC emphasized the need of working closely with the community, its organizations and Native corporations. N. Olemaun reviewed the role of the ICAS and its primary concern with insuring the cultural integrity of the Native community in the process of development.

ARCO's responses: ARCO wishes to reinforce to the members of the Barrow community its rock-solid policy of working cooperatively with them to achieve what we hope are mutually beneficial ends. ARCO places a very high priority on North Slope Inupiat subsistence culture and, as in the case of matters discussed above on the proposed Cabot offshore exploration project, not only listens to community concerns but designs its operations by taking them seriously into account. The most important example of this with respect to ARCO's current proposal deals with timing its plan of work to avoid interference with the subsistence bowhead hunt and conducting operations in the environmentally safest manner.

Various speakers made reference to the fact that they and the country need and will benefit from new discoveries of oil and gas. But they hoped equally that such exploration and production activities as might conceivably follow from a major discovery would not be at the expense of the vitality of Inupiat culture. ARCO shares both these views and would like to respond here by stating some of the areas in which past cooperative activity and future plans appear aimed toward a common set of goals.

Environmental Protection. The basic idea behind organizing and training village oil spill response teams was that it should be a cooperative effort between ARCO, North Slope Communities, village corporations and the NSB. Both ARCO and the villages must constantly confront the issue of protecting against, preparing for and responding to fuel spills. Thus the ARCO-funded spill team training programs in Barrow, Nuiqsut and Kaktovik were not designed exclusively to provide ARCO with additional skilled responders to possible spills during its offshore operations, but were aimed toward assisting local communities which face the same problems. At the same time those who have been and will be trained have added employable skills to their personal resumes.This program could not have succeeded without the cooperative efforts of all four parties involved.

ARCO has also joined with various North Slope groups in conducting environmental programs of mutual interest. Most recently (spring 1990) the Atlantic Richfield Foundation funded a grant to AEWC and the Nuiqsut Whaling Captains Association which resulted in the clean-up of spent drums and barrels from the Cross Island whaling camp. Through its wildlife monitoring programs, ARCO has also participated with the NSB and Slope villages in various studies of specific and general interest to both parties.

Employment and Business Activities. ARCO is proud of its record of North Slope resident hire with respect to the offshore exploratory activities it has conducted since 1989. In the two operations conducted to date (Stinson, 1989 and Fireweed, 1990) more than 30% of the drilling rig crews were recruited and employed from Slope communities. Piqniq Corp. has facilitated this hiring policy. ARCO intends to continue it aggressive resident hire program for the Cabot project.

There is an extensive record of direct business dealings and ventures between ARCO and the North Slope Native Corporations and their subsidiaries. In the case of the Cabot project it is clear that many services can be supplied through UIC and ASRC units. This would naturally present significant opportunities for NSB resident employment and training. Specific business negotiations are presently underway to that end.

Cultural and Subsistence Concerns. ARCO has encouraged and supported many activities of its North Slope neighbors that touch these areas. In 1990 a grant was made to the AEWC for the purpose of assisting it in defraying the management costs associated with the Cooperative Program for the Beaufort Sea (otherwise referred to as the Oil/Whalers Agreement). This communication program is expressly designed to eliminate potential conflicts between active whaling crews and oil industry offshore exploratory operations and has worked successfully in the mid and eastern Beaufort communities since 1986. ARCO has supported various projects of the NSB Commission on History and Culture including archeological work in Barrow. Undoubtedly there will be other projects in future where ARCO will have the opportunity to participate in the support of community programs whose purpose is to reinforce and strengthen the cultural bonds that link the Inupiat of the North Slope.

To summarize: ARCO believes that its past record of cooperation with the North Slope Inupiat communities on vital matters of environmental protection, job and business opportunities, concerns for the maintenance of subsistence culture--particularly bowhead whaling--and participation in other cultural projects is a pretty good one. Many speakers were kind enough to recognize this record which we appreciate. While the brief summary given here could not hope to address all the matters which may be of some concern to the Barrow community in weighing and evaluating ARCO's proposed Cabot exploratory program, we hope that you accept the spirit of willingness to cooperate with you that is at least outlined in all the above responses.

Thanks for attending the 20 March meeting and speaking up. We were listening and we have attempted to respond to you directly.

EXHIBIT C, Attach. 3, 1

STATEMENT
OF
THE ALASKA ESKIMO WHALING COMMISSION

Regarding ARCO'S
Exploratory Drilling Project
in the Beaufort Sea for 1991 and 1992

Barrow, Alaska
March 20, 1991

My name is Burton Rexford, I am an Inupiaq Whaling Captain and also the Chairman of the Alaska Eskimo Whaling Commission.

The location being proposed tonight by ARCO for exploratory drilling is an important bowhead whale hunting area for Barrow whalers. As you know, the bowhead whale is an extremely important resource for us, not only for subsistence purposes, but for our culture as well. Since the oil industry began exploring in our waters, the whaling crews in Barrow have been reporting fewer bowhead whales or no bowhead whales in areas where we have always hunted. Our whalers, in spite of great danger to human life, have begun to hunt farther from shore. But even when we can locate and take whales at these distances, we often lose the whale meat because of the time required for towing and this counts against our IWC quota.

In 1989, Barrow lost the meat from four whales because of this problem. And now with ARCO's plans, we are very concerned that these problems will only worsen.

Therefore, we do not want any drilling or boat and helicopter traffic during the fall bowhead whale hunt by ARCO until after Barrow gets their bowhead whale quota or stops its hunts. Also, we do not want any industrial activity during the spring hunt.

Another concern that we have has to do with the possibility of an oil spill from an oil blowout off the offshore exploratory well.

EXHIBIT C, Attach. 3, 2

We've been told many times that the risks of a blowout is low, but the statistics that this argument are taken from are almost entirely from offshore exploration outside of Arctic waters. Based upon my years as a subsistence hunter, I know the hazards of Arctic weather and sea ice. These hazards present increased risks to offshore oil exploration that have yet to be fully factored into risk assessments conducted by the oil industry.

In addition, I believe it will be virtually impossible to respond to an oil spill in Arctic waters, especially in the presence of sea ice. The proof here can be drawn easily from the experience gained during the so-called "gray whale rescue" offshore from Barrow a few years ago and the more recent disastrous clean-up attempts at Prince William Sound.

This is why AEWC asks that any activity in the Arctic OCS should be conducted only in the immediate presence of containment and cleanup equipment which has been proven capable prior to exploration.

AEWC also believes that any dumping of drilling muds into Arctic waters be avoided, as well as any other discharge from oil and gas exploration in the Arctic OCS. The food chain in the Arctic is very short. The North Slope Borough scientists who autopsy our bowhead whales each year are telling us that toxic levels of pollutants are being found in the organs of the bowhead whales. While the source of this pollution has not been identified, any potential pollution from OCS oil and gas operations cannot be tolerated since it directly affects the food upon which our people depend.

In regards to bowhead whale monitoring activities, the AEWC wants ARCO to follow the Site Specific Monitoring Guidelines recently outlined by the National Marine Fisheries Service.

I strongly urge you to give serious consideration to these concerns and comments. Furthermore, we will be monitoring the Letter of Authorization process to make sure that our concerns are adequately addressed before ARCO is given their LOA. Thank you for

EXHIBIT D

DRAFT PROPOSAL FOR

A MARINE MAMMAL MONITORING PROGRAM AT ARCO ALASKA, INC.'S CABOT EXPLORATORY WELL SITE, WESTERN BEAUFORT SEA, ALASKA, 1991/92 WITH SPECIAL EMPHASIS ON THE BOWHEAD WHALE

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April 1, 1991

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INTRODUCTION

ARCO proposes to conduct a site specific marine mammal monitoring program at the exploratory oil and gas lease site named Cabot. The prime focus of the monitoring effort will be placed on observing and describing the behavioral reactions of bowhead whales before, during and after their arrival at and passage beyond the SSDC/MAT, a bottom-founded drilling unit which will be operating in a warm-standby mode (not drilling) during the September-October 1991 bowhead whale migration and subsistence hunt. Acoustic, aerial, and visual monitoring from the SSDC platform will also be conducted for five other species of marine mammals: gray and beluga whales, ringed, bearded and spotted seals.

The Cabot study will be the third Beaufort Sea monitoring program which ARCO has sponsored since 1989. In that year Dr. John Hall and his team of scientists carried out a passive acoustical monitoring study at the Stinson exploratory well location in west Camden Bay. The results of that study were reported in John D. Hall and Jon Francine, "Report on Sound Monitoring and Bowhead Whale Calls Localization Efforts Associated with the Concrete Island Drilling Structure (CIDS) off Camden Bay, Alaska," Hubbs Marine Research Center-HMRC Technical Report 89-219 (San Diego, February 15, 1990), and in John D. Hall and Jon Francine, "Measurements of underwater sounds from a Concrete Island Drilling Structure located in the Alaska sector of the Beaufort Sea," Journal of the Acoustical Society of America, v. 88, no. 4 (April, 1991, forthcoming).

In 1990 the site specific passive acoustic monitoring program was continued by Dr. Hall and his team for a second year at ARCO's Fireweed exploratory well site in the western Beaufort Sea twelve miles offshore from Pitt Point. The results of that program are reported in John D. Hall, Marianne L. Gallagher, Kenneth D. Brewer, and Donald K. Ljungblad, "Passive Acoustic Monitoring Program at the ARCO Alaska, Inc. 'Fireweed Prospect, September-October, 1990," COPAC Report for ARCO Alaska, Inc. (March, 1991).

Passive acoustic monitoring at the Cabot location in the far western lease sale area of the Beaufort Sea is proposed for the third year of the monitoring and study program carried out by Hall and his team. As in the previous efforts reported above, passive acoustic monitoring for the presence, absence, distribution and abundance, behavioral responses, and calling activity of bowhead whales during their annual fall westward migration will be a main feature of the program. In addition, this study proposes to incorporate an aerial observation component covering the peak pulse of the migration expected to arrive between 25 September and 7 October in the study area. Bowhead behavior will be identified before the arrival of whales, during their presence in the vicinity of the SSDC/MAT, and after they have passed beyond the area of activity. Linked to this basic objective are other tasks designed to address a variety of intriguing questions which involve analysis and comparison between bowhead calling activity during both the spring north and eastward migration and the fall return passage.

A final main component of the monitoring program is to record sounds produced by the SSDC at known distances and water depths. From these data SSDC sound source levels and accompanying transmission losses can be calculated. In the Stinson and Fireweed studies, acoustic measurements of the sound energy levels produced by the two bottom-founded drilling units on warm standby were made during open water conditions. Comparable measurements under actual drilling conditions were made at Stinson only after the whale migration was over and the sea ice surface stabilized sufficiently to permit the work. The drilling program concluded at Fireweed before similar work could be accomplished. For the Cabot monitoring program, this objective will be met in the same fashion as at Stinson: SSDC sound production during actual drilling activity will be recorded when ice conditions permit working safely on the sea ice surface. An essential feature of this program component is that it is designed to record underwater sounds that fall in the very low (or infrasonic) ranges where, the Stinson study revealed (Hall and Francine, 1991), >95% of actual drilling sounds in the marine environment occur

Recipients of this draft monitoring program description are warmly invited to comment on its design, objectives and methods. The intent here is to insure not only that the regulatory agencies which mandate monitoring programs for offshore oil and gas exploratory operations are satisfied that their regulatory requirements are adequately met, but that the best possible scientific program design is achieved and that its results make a positive contribution to scientific understanding of bowhead whale biology and arctic marine acoustics.

CABOT EXPLORATORY PROGRAM AND TIMING

The Cabot exploratory well project is proposed for a site located 30 miles east from Barrow and approximately 15 miles north from Dease Inlet in 45-50 foot water depths (see Map 1). The drilling unit to be employed is CANMAR's SSDC/MAT, a mobile bottom-founded structure (see Fig. 1).

The exploration program would begin in summer (early to mid August). A brief site clearance program involving water depth measurements, soil core samples, and shallow hazards seismic testing will be conducted prior to towing the SSDC from its present warm standby location offshore from Pitt Point to the Cabot exploratory site. The bulk of supplies required for the drilling program--including fuel and water--would be loaded on the SSDC before it is moved. Therefore, very little surface vessel traffic to the rig is anticipated. This timing is quite similar to that which was scheduled for the Fireweed exploration program and is done in large measure to insure the least possible potential disturbance to either the bowhead fall migration or the subsistence hunt.

The start-up of actual drilling operations would not commence until such time as the bowhead westward fall migration has been determined by NMFS to have passed the Cabot location and the subsistence hunt is declared over by the AEWC.

One feature of the Cabot location is abundantly clear: it rests within an area occasionally used by bowhead whales as a feeding/aggregation habitat (most recently in 1984 and 1989; Moore, 1990). In other years (1983, for example; Ljungblad, 1986) the migration corridor appears to have been located well north of the Cabot location, most likely a function of early season nearshore ice formation. However, the probabilities are that either small or substantial numbers of migrating bowheads will be present at some point during the proposed monitoring activity. These waters are also within the normal range of Barrow subsistence hunters.

Since the SSDC will be operating only on warm standby during the period when whales might be expected to pass through or remain in the area, the structure should provide an ideally located study site from which to conduct both the passive acoustical location program and observations of bowhead behavioral responses within visual range of the platform itself.

Noise introduced into the marine environment from the SSDC operating in the idle mode should not--if the Stinson and Fireweed studies can be taken as a guide--elicit avoidance response from whales present in the area.

However, one of the objectives of the monitoring program is to test this hypothesis at a location that is very similar to, but fairly distant from, the Stinson and Fireweed sites. In this case, a ground-truthing component will be added in the form of aerial observations.

MONITORING STUDY OBJECTIVES

OBJECTIVE I. To locate and record the behavior of westward migrating bowhead whales prior to their arrival in the vicinity of the SSDC/MAT drilling unit operating in a warm standby mode; to observe and record the whales' behavior while they remain in that vicinity; and to monitor their behavior once they have passed westward beyond the vicinity of the activity.

OBJECTIVE II. To determine the actual locations of whales by range and bearing in relation to the SSDC using both passive acoustical and aerial observational methods.

OBJECTIVE III. To conduct bowhead distribution and abundance analyses within the general vicinity of the study site.

OBJECTIVE IV. To record and analyze bowhead vocalizations.

OBJECTIVE V. To measure and record sound pressure levels produced by the SSDC when operating under actual drilling conditions and to calculate sound transmission losses at varying distances and water depths.

OBJECTIVE VI. To employ data acquired in the Cabot monitoring program to address other biological topics associated with their calling activity, fall migration group size and composition, and apparent movement in migratory pulses.

THE STUDY AREA

Based on the sound propagation characteristics measured and calculated for the SSDC/MATS operating in warm standby mode at the Fireweed location, received sound levels from the drilling unit above Beaufort 0 Sea State Ambient Noise Level should not extend further than 10,000 m (10 km) from the source (Hall, et al., 1991; for further comparison to another bottom-founded drilling unit, the CIDS, see Hall and Francine, 1990 and 1991a). This distance represents the maximum possible study area radius and is described as the immediate vicinity of the activity within which bowhead behavioral responses can be observed and correlated with drilling unit sound production during warm standby mode.

However, an expanded study area covering 5000 km sq around the Cabot exploratory site is defined in order to conduct all aspects of the aerial component of the monitoring program. While aerial observations of bowhead behavioral responses in the immediate vicinity of the unit is a prime focus, the items set forth in Objectives II, III and VI, above, will be covered over the wider area of aerial surveying.

METHODS

Described below are the methods proposed to acquire and analyze the data which relate to the six stated Monitoring Study Objectives. Objectives I, II, and VI will require data acquisition by both passive acoustic and aerial observational methods. Objective III will be met primarily through analysis of the data acquired from aerial surveying. Objectives IV and V will be met through collection and analysis of data acquired through the passive acoustic program components.

A. Aerial Surveys.

The aerial survey component of the Cabot monitoring program will be designed to accomplish all the features specified for aerial observation activity in the NMFS site specific monitoring guidelines for 1991.

Prior to the commencement of activities at the proposed drillsite location, both the normal bowhead migratory pathway along the 20 metre bathymetry contour line leading from east to west and the immediate vicinity of the drillsite location will be surveyed from the ARCO Twin Otter aircraft flying a crew of biologist observers. Regular (twice to three times

weekly) periodic surveys of the same areas will be conducted by the Twin Otter observer crews from late August through September 24 and from October 8 until the conclusion of the 1991 bowhead migration. No transect survey flights are planned for this aerial monitoring component; however, sighting data which is acquired will assist in determining the potential approach of bowheads and their presence within the site specific monitoring area. Such sighting data will also provide for an appropriate definition of the control area to be incorporated in the concentrated aerial survey scheduled for 25 September through 7 October (see below). For these periodic samplings the Twin Otter will be equipped with navigational and GPS location systems including an on-board computer dedicated to marine mammal sighting data collection and processing.

Because the greatest number of bowhead whales migrate through the Alaskan sector of the Beaufort Sea, including the proposed Cabot drillsite area, during the last week of September and the first week of October (Hall, 1991; Moore and Clarke, 1990; Ljungblad, et al., 1988), aerial transect surveys will be conducted daily during the hours of daylight, weather permitting, from 25 September through 7 October.

This concentrated survey period (25 September through 7 October) will be conducted from a twin engine, high wing Rockwell 680 FL Commander. This aircraft has been specially modified for Arctic aerial surveys and includes the following modifications: (1) Full de-icing system including heated windshield, hot props, heated cowls, wing, vertical and horizontal stabilizer de-ice boots; (2) 1240 nautical mile range (2269 km) at 120 knots survey speed and 238 knots (274 mph) transit speed at 70% power settings; (3) Arctic survival equipment including HF/SSB radio, 2 VHF com/nav radios, Marine VHF radio, FAR Part 135 survival raft, survival suits for all on board, Aviation and 406 mHz ELT/EPIRB, and Trimble GPS/Loran navigation system; (4) Elongated "bubble" windows for centerline viewing at observer stations 3 and 4; (5) On board aerial survey computer including custom software for near real-time determination of marine mammal densities using either the line transect (Fourier) or strip transect estimators. The aerial survey computer determines the three dimensional location of the aircraft using an independent Trimble GPS navigation system dedicated to the survey computer.

In order to cover the 5000 km sq study area, aerial surveys will be designed to use systematic transect lines oriented north-south and placed 7.3 km (4 nm) apart. One aerial survey of the Cabot monitoring area will include slightly less than 610 km (330 nm) of trackline. Surveys will be flown starting at the western-most trackline and proceed through the most

easterly trackline. This procedure of flying "against the grain" of the fall migration will reduce the potential of double sighting the same whale on two different tracklines.

The aerial surveys will be flown at 457 m (1500 ft.) and a speed of 120 knots. The aircraft survey crew will include the pilot, primary observer (no. 2, rt. front seat), secondary observer (No. 3 left rear seat) and recorder/observer (No. 4, rt. rear seat). All observers will be experienced marine mammal biologists or field technicians with appropriate training and qualifications for this task (such as North Slope local personnel with backgrounds in the various NSB/AEWC bowhead census programs). The observers to be employed on the survey will have from two to fifteen years of experience conducting marine mammal surveys, including Arctic waters.

Aerial survey data will be collected using an unbounded survey design (Burnham et al., 1980). Vertical sighting angles will be measured for all sightings in order to determine the distance from trackline to sighted marine mammal. Upon completion of the aerial survey a determination will be made whether or not sufficient sightings have been made to utilize a line transect (Fourier) estimator (unbounded condition), or a strip transect estimate using 0.93 km (0.5 nm)/side strip widths. The on board computer and custom software provide capability to determine density estimates using either estimator.

Aerially observed bowhead whale behaviors will be recorded both on transect and off in order to include behaviors within the study area. The following sets of behavioral parameters will be recorded:

Primary behaviors: (1) Number of whales sighted; (2)Number of groups of whales sighted; (3) Number of whales in each group; (4) Group composition including estimates of adults, sub-adults or juveniles, and calves; (5) Number of assumed cow/calf pairs; (6) Swimming direction of individuals and groups.

Secondary behaviors: (1) Respiratory rates of individuals; (2)Dive times of individuals and synchronous diving within groups; (3) Overt surface behaviors such as lobtailing, breeching, flipper-slapping, copulation, or feeding; (4) Estimates of swimming speeds of individuals, including changes of swimming speed and/or direction.

During aerial surveys 8mm tele-video footage of bowhead behaviors will be recorded for post-survey analysis and possible identification of individuals.

Aerial observations of any of the other five species--grey and beluga whales, ringed, spotted and bearded seals--sighted within the study area will be recorded and behavioral data, if any, incorporated within the study parameters of the monitoring program.

B. Passive Acoustic Bowhead Call Localization.

The passive acoustic monitoring component of the program will utilize longlife sonobuoys moored in arrays located 11 km to the east-southeast and 8 km to the west-northwest of the Cabot location. The arrays have a minimum of 3 sonobuoys in each array monitored 24h/day from 5 September until ice formation. These arrays, based on 1989 and 1990 drillsite monitoring experience in Camden Bay and off Pitt Point, will be able to detect and localize calling whales from 5 km to 70 km away from the arrays (see Hall, et al., 1991 for a review of whale call localization methods using digital recording and signal processing). The localization distance estimates are based on various combinations of ambient noise levels, masking by industrial sounds and transmission loss estimates for the area near the drillsite. By mooring two arrays of sonobuoys in locations southeast and northwest of the drillsite, we will be able to monitor the acoustic movements and progress of calling bowheads as they approach, pass and depart from the drillsite area. In this manner we will be better able to detect changes in calling rates and swimming speed and direction. Analysis of this data will enhance understanding of potential changes in whale behavior which may be associated with an offshore exploratory operation.

All other marine mammal vocalizations will also be recorded and incorporated within the study parameters.

C. Visual Monitoring From the SSDC.

An Inupiat Communicator/Monitor and an experienced marine mammal observer will be aboard the drilling unit throughout the duration of the monitoring program. They will monitor for the presence and behaviors of marine mammals within visual sighting distance of the SSDC drilling unit (potentially up to 10 km under ideal visibility conditions from observational posts located 135 ft. above the sea surface). All marine mammal sightings will be recorded on sighting logs using appropriate

formats for marine mammal sightings and behavioral observations.

D. Study of the Marine Acoustic Environment.

Key aspects of the acoustical monitoring component of this program will involve data acquisition and analysis of sound source levels produced by the SSDC in the drilling mode and their attenuation in the marine environment which constitutes the study area. To accomplish this objective three features will be recorded and precise acoustic properties calculated:

(1) Received and Source Levels. Recordings lasting several minutes will be made using a TEAC RD-101T Digital Audio Tape Recorder (rated response is flat from 0.2 Hz to 20 kHz), Bruel & Kjaer 8103 hydrophone(rated response is flat +/- 1.5 dB from 0.1 Hz-50kHz]) and Bruel & Kjaer 2635 Charge Amplifier at several different distances and water depths from the drilling unit. In addition, salinity and temperature data for all recording depths at all stations will be made in order to provide accurate speed of sound estimates using the Leroy equation (Bruel & Kjaer, 1986).

The use of digital recording equipment enables one to record infrasonic frequencies as low as 0.2 Hz. Hall and Francine (1990,1991a) have noted infrasonic frequency components in the recordings made of the bottom-founded CIDS drilling unit while it was drilling in ice covered areas. LGL Ltd. (1990) in a proposal to the Minerals Management Service noted that "oil platforms in temperate waters, icebreakers and other large ships are known to emit strong infrasounds." The infrasonic frequencies reported for the CIDS represented more than 95% of all the sound energy transmitted to the water by the drilling unit. It seems appropriate to continue using digital recording technology when recording sources which may contain infrasonic frequencies, i.e. drilling operations, ship traffic, balaenid and balaenopterid whales.

(2). Ambient Noise Levels. In addition to the sounds produced by the drilling unit, recordings will be made, using the technology described above, of the broad band and 1/3 octave ambient noise levels in the vicinity of the study site. Recordings of ambient noise levels may be compromised by the presence of vessels not associated with the Cabot project and by seismic operations operating within 100 km of the prospect.

(3) Transmission Loss Estimates. During our efforts to record received sound levels from the drilling unit, we will also calculate, based

on the received levels at several distances and directions from the SSDC, the acoustic transmission loss for the study area. Previous efforts similar to this in other areas of the Beaufort Sea have produced transmission loss estimates ranging from 8.7 Log R to 12.6 Log R (Hall and Francine, 1990, 1991a; Miles et al., 1987; C. Malme, BBN pers. comm. to Davis, 1987 for the Hammerhead site). Transmission loss in these relatively shallow waters likely follows spherical spreading loss (20 Log R) from the source to a distance equal to the water depth and then assumes loss characteristics approaching cylindrical spreading (10 Log R) out to beyond the limits of the study area. Our transmission loss measurements will determine if these assumptions are correct and provide a transmission loss estimate for the monitoring area.

E. Other Questions to be Addressed in the Monitoring Effort.

Two questions have arisen from a close examination of the results of the Stinson and Fireweed acoustic monitoring efforts that will be addressed in the Cabot program. These involve:

(1) Acquiring recordings of the calling frequencies and rates produced by migrating bowhead whales in the fall in order to compare them with the frequencies and calling activity characteristic of the spring migration. From the recorded data collected to date, it would appear that calling activity during the fall migration occurs primarily at night (> 77% of calls were received between 1800h and 0600h in the Fireweed monitoring study, Hall et al., 1991), a phenomenon also noted in other acoustic recording studies of the fall migration (see, for example, Ljungblad, et al., 1987).

Calling activity during the spring migration through leads at Barrow is often intense during daylight hours as the whales navigate north and eastward in often heavy ice (Clark, 1991). The question addressed here is whether bowheads may engage in calling activity for at least two different purposes: (a) To use calls for purposes of navigation while swimming through ice infested waters; and (b) to communicate with other whales especially during periods of reduced visibility under open water conditions. A related question involves whether bowheads employ different frequencies and call types for these differing purposes. While no experimental design is envisaged to address this question during the proposed Cabot monitoring effort, data will be acquired that may prove useful should an experimental program comparing bowhead fall and spring calling rates and frequencies be carried out in the future.

(2) Analysis of both the acoustically acquired sighting data and that

obtained from the aerial survey component of the monitoring program in an effort to verify the premise that the fall bowhead migration through the Beaufort Sea occurs in three pulses which can reasonably be thought to take place in the periods 10 to 18 September, 27 September to 7 October, and 10 to 20 October with the middle of these pulses containing the largest number of migrating whales. The 1991 sighting data to be collected as part of the Cabot monitoring program will be analyzed with reference to both the aerially and acoustically acquired data of survey work done annually since 1979 to test this premise.

SUMMARY

While ARCO and its scientific contractor recognize that the primary purpose of the marine mammal monitoring program at the Cabot location is to detect whether the proposed exploratory operation produces identifiable responses from bowhead whales or other marine mammals that migrate past or remain within the vicinity of that operation, we also believe that major and very costly efforts such as the program proposed here (including as it must both passive acoustic and aerial observation components) should also be aimed at enriching our scientific knowledge of the mammals being studied and the acoustic properties of the Arctic marine environment which they utilize. For this reason we propose the six objective monitoring program and associated methodology outlined in the above proposal.

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EXHIBIT E

ARCO Alaska Inc CABOT #1 EXPLORATORY WELL PROJECT
Western BEAUFORT SEA, Alaska (1991 - 1992)

POLAR BEAR/PERSONNEL ENCOUNTER PLAN

The Marine Mammals Management Section - US Fish and Wildlife Service, Anchorage, AK has on file the Polar Bear/Personnel Encounter Plan approved for use on the SSDC/MAT Drilling Unit as appropriate for work conducted there on the Fireweed #1 Exploratory Well Project, Beaufort Sea (1990 - 1991).

This plan was approved by USFWS and the Alaska Department of Fish and Game. It requires minor site specific modifications for application to the CABOT project which is located approximately 45 miles northwest from the Fireweed site.

A polar bear monitoring and reporting component is included in both the Fireweed and Cabot plans.

When a completed CABOT POLAR BEAR/PERSONNEL ENCOUNTER PLAN is waible (expected by 5.15.91) it will be filed with NMFS and MMS to complete this EXHIBIT E to the application for a Letter of Authorization.

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October 24, 1990

Mark N. Savit, Esq.
Jackson & Kelly
1701 Pennsylvania Avenue, N.W.
Washington, DC 20006

Dear Mark:

On behalf of your clients, Amoco Production Company; ARCO Alaska, Inc.; BP Exploration (Alaska), Inc.; Chevron U.S.A. Inc.; Conoco Inc.; Exxon Corporation; Shell Western E&P Inc.; Union Oil Company of California; and Western Geophysical Company (collectively "the MMPA Group"), you have requested a letter of assurance with respect to the Alaska Eskimo Whaling Commission's ("AEWC") intentions in light of the MMPA Group-AEWC joint proposal to amend the National Marine Fisheries Service's ("NMFS") incidental take regulations, 50 C.F.R. Part 228, Subpart D. This joint proposal is set forth in the Joint Petition to Amend Regulations Governing the Taking of Marine Mammals Incidental to Oil and Gas Exploration Activity in Alaska (the "Petition"), to be filed with NMFS by the above named parties.

It is our understanding that the MMPA Group conditionally agrees to abide by the terms of the proposed amendments effective immediately, and will continue voluntarily to abide by the amendments until they become binding pursuant to final promulgation by NMFS. You have notified us that the condition precedent to this agreement by the MMPA Group is receipt of written assurance from the AEWC that those two organizations will take no action, nor in the future directly or indirectly support any action taken by others, challenging the lawfulness of 50 C.F.R. Part 228, Subpart D; and that they have no intention of supporting, directly or indirectly, any action seeking a legislative prohibition on offshore drilling activities in the Chukchi or Beaufort Seas while the Petition is pending and, if the requested amendments are adopted in a timely fashion, during the period such regulations remain effective under present circumstances. You also requested assurance that if circumstances change, other than through action taken pursuant to the agreed upon amendments, such that the AEWC or the BSFA conclude that legislative action is necessary, those parties will consult with the MMPA Group before pursuing such legislative action.

We have notified both the AEWC of your request and have been authorized to inform you of their agreement to abide by the above stated conditions.

Sincerely,

S. Lynn Sutcliffe

SLS/sks

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE

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JOINT PETITION TO AMEND REGULATIONS GOVERNING THE TAKING OF MARINE MAMMALS INCIDENTAL TO OIL AND GAS EXPLORATION ACTIVITIES IN ALASKA, 55 FED. REG. 29214 (1990) (to be codified at 50 C.F.R. Part 228, Subpart D)

Submitted on behalf of:

Amoco Production Company
ARCO Alaska, Inc.
BP Exploration (Alaska), Inc.
Chevron U.S.A. Inc.
Conoco Inc.
Exxon Corporation
Shell Western E&P Inc.
Union Oil Company of California
Western Geophysical Company

Alaska Eskimo Whaling Commission

November 26, 1990

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE

JOINT PETITION TO AMEND REGULATIONS GOVERNING THE TAKING OF MARINE MAMMALS INCIDENTAL TO OIL AND GAS EXPLORATION ACTIVITIES IN ALASKA, 55 FED. REG. 29214 (1990) (to be codified at 50 C.F.R. Part 228, Subpart D)

Amoco Production Company; ARCO Alaska, Inc.; BP Exploration (Alaska), Inc.; Chevron U.S.A. Inc.; Conoco Inc.; Exxon Corporation; Shell Western E&P Inc.; Union Oil Company of California; and Western Geophysical Company (collectively, the "Petitioners"); and the Alaska Eskimo Whaling Commission ("AEWC"), pursuant to Section 553(e) of the Administrative Procedure Act, 5 U.S.C. §553(e), jointly petition for the amendment of regulations governing the taking of marine mammals incidental to oil and gas exploration activities in Alaska, 55 Fed. Reg. 29214 (1990)(to be codified at 50 C.F.R. Part 228, Subpart D)(the "incidental take regulations"), in the following respects: (1) in section 228.33, by adding subsections (c) and (d) relating to seismic operations and support and supply vessel operations; (2) in section 228.34, by making certain punctuation changes; (3) in section 228.35, by adding subsection (a) relating to activity levels for exploratory drilling and seismic operations and by redesignating the existing provisions of this section as subsection (b); (4) in section 228.36, by adding certain qualifying language; (5) in section 228.37, by deleting certain language in subsection (a), by adding

a new subsection (e) relating to observers, and by revising and redesignating existing subsections (e) and (f) as subsections (f) and (g), respectively; and (6) in section 228.38, by adding certain qualifying language to subsection (a)(2); all as more particularly shown on the mark-up of the incidental take regulations attached to and made part of this petition as Exhibit A.[1] In support of this request, Petitioners and the AEWC state as follows:

I. INTRODUCTION

1. On February 16, 1988, the Petitioners, pursuant to Section 101(a)(5) of the Marine Mammal Protection Act ("MMPA") and Sections 7(b)(4) and 7(o) of the Endangered Species Act ("ESA"), petitioned the National Marine Fisheries Service ("NMFS") to promulgate regulations that would allow the taking of bowhead and gray whales incidental to oil and gas exploratory activities in the Beaufort and Chukchi Seas (the "Petition"). Four additional species (beluga whales; and spotted, bearded and ringed seals) were subsequently included in the rulemaking process.

2. On April 13, 1988, NMFS published a Notice of Receipt of Request for Rulemaking and Request for Information which announced the availability of the Petition for review and solicited public comments thereon. 53 Fed. Reg. 12170 (April 13, 1988).

3. Numerous comments were received by NMFS in response

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[1] Language proposed to be added to the incidental take regulations is underscored; language proposed to be deleted is designated by strike-throughs.

to its notice. Following its review of the comments submitted concerning the Petition, NMFS completed and, on May 4, 1989, issued an Environmental Assessment ("EA") in which it made a finding of no significant impact regarding the proposal of rules requested in the Petition. Specifically, a finding was made that the impact on populations of marine mammals would be negligible, and there would be no unmitigable adverse impacts on the availability of the species for subsistence by Alaska natives.

4. On October 3, 1989, NMFS published a Notice of Proposed Rulemaking in which it set forth its proposed incidental take regulations and solicited comments thereon. 54 Fed. Reg. 40703 (October 3, 1989).

5. The proposed incidental take regulations were based, in part, on the following activity levels over the 5-year period to be covered by the regulations: (1) up to 77 exploratory wells, and (2) up to approximately 17,500 trackline miles of seismic surveys.

6. On July 18, 1990, following its review of the comments received and two public hearings, NMFS published final incidental take regulations which are to be codified at 50 C.F.R. Part 228, Subpart D. 55 Fed Reg. 29214 (July 18, 1990).

II. REASONS FOR AND THE NATURE OF THE REQUEST

7. Throughout the rulemaking process, various groups - most notably, the AEWC - voiced strong opposition to the incidental take regulations.

8. The grounds raised by the AEWC in opposition to the incidental take regulations centered on its concern that exploratory operations not adversely impact the subject marine mammals, their habitat and their availability for subsistence uses, and NMFS' findings in this regard.

9. Absent a resolution of the issues between the parties, concurred in by NMFS, the AEWC has represented that it would be obliged to file a legal action challenging the lawfulness of the incidental take regulations.

10. Ongoing discussions have been conducted over the last several months among the Petitioners and the AEWC in an effort to address the concerns of the AEWC.

11. As a result of those discussions, the Petitioners and the AEWC have reached an agreement with respect to the manner in which the incidental take regulations could be amended to adequately address the concerns raised by the AEWC. This agreement is reflected in the language of the proposed amendments to the incidental take regulations requested in this Petition, as set forth in Exhibit A.

12. If the amendments requested herein are adopted by NMFS, the AEWC represents that its concerns will have been satisfactorily resolved and, further, that it will not institute any action, legal or otherwise, challenging the lawfulness of the incidental take regulations.

WHEREFORE, following notice of an opportunity for public

comment on the proposed amendments, Petitioners and the AEWC respectfully request that the incidental take regulations be amended in the manner set forth above, as more particularly shown on Exhibit A.

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EXHIBIT A

PART 228 - REGULATIONS GOVERNING SMALL TAKES OF MARINE MAMMALS INCIDENTAL TO SPECIFIED ACTIVITIES

1. The authority citation for Part 228 continues to read as follows: 16 U.S.C. 1371(a)(5).

2. Subpart D is added to read as follows:

Subpart D - Taking of Marine Mammals Incidental to Oil and Gas Exploration Activities in Alaska

§228.31 Specified activity and specified geographical region.

§228.32 Effective dates.

§228.33 Permissible methods of taking.

§228.34 Prohibitions.

§228.35 Level of Activity.

§228.36 Measures to ensure availability of species for subsistence.

§228.37 Requirements for monitoring and reporting.

§228.38 Letters of Authorization.

§228.31 Specified activity and specified geographical region.

Regulations in this subpart authorize only the non-lethal incidental taking of bowhead, gray, and beluga whales and bearded, ringed, and spotted seals by U.S. citizens engaged in oil and gas exploration in the Chukchi Sea or Beaufort Sea off the coast of Alaska. The geographical region includes Alaska state waters and outer continental shelf waters that have been leased for exploration or that are being considered for leasing. The activities include geophysical surveys and exploratory drilling and support operations (e.g., ice-breakers, supply vessels and

aircraft).

§228.32 Effective dates.

Regulations in this subpart are effective for a 5-year period, and Letters of Authorization must be renewed annually. A take of marine mammals is not authorized each spring until the bowhead whale has completed its migration through the spring lead system in the Chukchi Sea and Beaufort Sea. This period is about from mid-April through early June. Each year, the National Marine Fisheries Service will determine when the bowhead whale has completed its migration through the spring lead system, and will notify the exploration companies and the native communities when it has made this determination.

§228.33 Permissible methods of taking.

(a) The incidental, but not intentional, non-lethal taking of marine mammals is permissible by U.S. citizens under a Letter of Authorization issued pursuant to § 228.38 for the following activities other than when bowhead whales are using the spring lead system:

(1) Geophysical surveys including shallow hazard and acoustic surveys and

(2) Exploratory drilling including ice-breakers, support vessels and aircraft.

(b) The activities identified in §228.33(a) must be conducted in a manner that minimizes to the greatest extent possible any adverse impacts on marine mammals, their habitat, and on the availability of marine mammals for subsistence uses.

(c) (1) Seismic exploration operations in the Beaufort Sea east of a line 50 miles west of Point Barrow shall, to the maximum extent practicable, be concluded prior to September 1 in waters east of Prudhoe Bay, and by September 15 in waters west of Prudhoe Bay.

(2) In the event such seismic operations cannot be concluded prior to those dates, the following conditions must be fulfilled before any further operations may continue:

(i) The operator must consult with NMFS and with affected subsistence whaling communities regarding the presence of whales in or near the area of operations and those areas in which whaling activity may take place; and

(ii) Such operations must be planned and conducted so as to:

(A) mitigate any adverse impact on the availability of the species or stock for subsistence uses;

(B) not exceed a negligible impact on the species or stock;

(C) provide that seismic vessels within a 15 mile (24 km) radius of a pursuing whaling crew's estimate of the position of a bowhead whale being pursued shall move out of that radius, or cease seismic operations while within that radius;

(D) occur, to the maximum extent practicable, in areas and during periods when there is no active whaling;

(E) assure that operations are completed in the minimum time necessary, without compromising the safety of the vessels affected; and

(F) assure that there are mechanisms available to facilitate direct communications among whalers and seismic vessels in order to allow seismic vessels to avoid areas of active whaling.

(iii) Notwithstanding the above, the conditions set forth in subparts (2)(i) and (ii) of this section shall not apply if:

(A) The affected subsistence whaling community has reached its bowhead quota; or

(B) The operator and the subsistence whaling community otherwise agree.

(d) Support and supply vessels within a 10 km (6.25 mile) radius of a pursuing whaling crew's estimate of the position of a bowhead whale being pursued shall move out of the radius, or cease operating while within that radius, or if neither of the above is practicable, shall undertake to the fullest extent practicable, all available measures to avoid any potential interference with the pursuit.

§228.34 Prohibitions.

Notwithstanding takings authorized by §228.33 or by a Letter of Authorization issued under §228.38, the following activities are unlawful:

(a) The take of any marine mammal in the spring lead system used by bowhead whales in the Chukchi Sea and Beaufort Sea (See §228.32);

(b) The incidental take of a marine mammal other than by unintentional, non-lethal harassment; ~~or~~

(c) The violation or the failure to comply with the terms,

conditions and requirements of these regulations or a Letter of Authorization; or

(d) The incidental taking of any marine mammal not specified in these regulations or by a Letter of Authorization.

§228.35 Level of activity.

(a) Subject to the restrictions set forth in these regulations the taking of marine mammals incidental to the following activities is authorized:

(i) Exploratory drilling operations conducted from natural islands or artificial islands constructed from gravel or ice;

(ii) Exploratory drilling operations conducted from no more than six Mobile Offshore Drilling Units ("MODU") as defined at 46 C.F.R. §107.112 at any one time in the U.S. Beaufort and Chukchi Seas;

(iii) Exploratory drilling operations conducted from an average of five (5) exploratory wells from MODU's per year, not to exceed twelve (12) exploratory wells from MODU's in any one year; and

(iv) Seismic exploration of an average of 7,000 vessel miles of data acquisition per year not to exceed

15,000 vessel miles of data acquisition in any single year.

For the purposes of this section, an exploratory well from a MODU shall include all operations conducted (i) from a multiple slot MODU at the same surface location, or (ii) from a MODU within a 2,500 foot radius from the surface location at which initial drilling is commenced, provided that the move from the initial surface location is due to avoidance of geological hazards. In computing the number of such wells, a well shall be counted only in the year in which operations are first commenced at that surface location.

(b) When Letters of Authorization are requested each year, the National Marine Fisheries Service will determine whether the level of activity identified in the requests exceeds that considered by the National Marine Fisheries Service in making a finding of negligible impact on the species and a finding of no unmitigable adverse impact on the availability of the species for subsistence. If the level of activity is higher, the National Marine Fisheries Service will reevaluate its findings to determine if those findings continue to be appropriate based on the higher level of activity. Depending on the results of the evaluation, the National Marine Fisheries Service may, after notice and opportunity for public comment, deny the request for a Letter of Authorization, or add conditions or mitigating measures that would make the impact negligible.

§228.36 Measures to ensure availability of species for subsistence.

When applying for a Letter of Authorization, the applicant must submit a plan of cooperation that identifies what measures have been taken and will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses if the activity takes place in or near a traditional subsistence hunting area. A plan must include the following:

(a) A statement that the applicant has notified the affected subsistence communities and met at an agreed upon location with residents of each such affected subsistence communit~~iesy~~ and its authorized representatives, if any, to discuss proposed exploratory activities and to attempt to resolve potential conflicts regarding siting, timing, and methods of operation;

(b) A description of what measures the applicant has taken and will take to ensure that exploratory activities will not interfere with subsistence whaling, including reasonable efforts to implement a formal communications agreement; and

(c) What plans the applicant has, up to and during the exploratory operations, to continue to meet at an agreed upon location with residents of each such affected subsistence communit~~iesy~~ and its authorized representatives, if any, ~~up to and during the exploratory operations~~ to attempt to resolve conflicts

and to notify the communities of any changes in the operation.

As used in these regulations, the term "authorized representative" shall mean a person or entity designated as such by the affected subsistence communities through written notice to NMFS.

§228.37 Requirements for monitoring and reporting.

(a) Holders of Letters of Authorization and their employees, agents, and designees must cooperate with the National Marine Fisheries Service and other designated Federal, State, or local agencies to monitor the impacts of oil and gas exploration on marine mammals. The Holder must notify the National Marine Fisheries Service, Alaska Region, of any activities specified in §228.33 ~~or any other activity~~ that may involve a potential take at least 30 days prior to the activity in order to satisfy §228.37(d).

(b) Holders of Letters of Authorization must designate a qualified biologist or another appropriately experienced individual to observe and record the effects of exploration activities on marine mammals. The observer must be approved by the National Marine Fisheries Service.

(c) When applying for a Letter of Authorization, the applicant must include a site-specific plan to monitor the effects on populations of marine mammals that are present during

exploratory activities. This plan, which must be approved by the National Marine Fisheries Service, should identify what survey techniques will be used to determine the movement and activity of marine mammals near the exploratory sites including migration and other habitat uses, such as feeding. A qualified biologist or another appropriately experienced individual must observe the behavior of the marine mammals present to determine if they are being affected. The monitoring program should document the acoustical effects on marine mammals and document or estimate the actual level of take. The requirements for monitoring plans may vary depending on the activity, the location, and the time.

(d) At its discretion, the National Marine Fisheries Service may place an observer on board drillships, aircraft, etc. to monitor the impact of exploration activities on marine mammals.

(e) Authorized representatives of affected communities may request the National Marine Fisheries Service to place an observer representing those communities and designated jointly by them on board drillships and seismic vessels to monitor the impact of exploration activities on marine mammals and the National Marine Fisheries Service shall accommodate all such reasonable requests, taking into account vessel space constraints. However, no observers shall be placed on any vessel pursuant to this subsection if the parties have already provided for the placement of an observer or communicator on board the vessel pursuant to a cooperative or communications agreement then in effect.

(f) The holder of a Letter of Authorization must submit a report to the Assistant Administrator for Fisheries within 90 days of the completion of any exploratory activities. This report must include the following information:

(1) Dates and types of activity;

(2) Dates and locations of any activities related to monitoring the effects of exploration on marine mammals; and

(3) Results of the monitoring activities including an estimate of the actual level and type of take, species name and numbers of each species observed, direction of movement of species, and any observed changes or modifications in behavior.

A copy of the report shall be sent to affected local subsistence communities and authorized representatives of those communities, if any, at the time it is submitted to NMFS.

(g) Results of behavioral, feeding, or population studies must be made available to the National Marine Fisheries Service before applying for a Letter of Authorization for the following year. Copies of these results shall be sent to affected local communities and authorized representatives of those communities, if any, at the time the results are forwarded to NMFS.

§228.38 **Letters of Authorization.**

(a) (1) To obtain authorization for an incidental take of marine mammals pursuant to these regulations, each company conducting an exploratory activity in the geographical area described in §228.31 must apply for a Letter of Authorization for each geophysical survey or seismic activity and each drilling operation.

(2) The application must be submitted to the National Marine Fisheries Service at least 90 days before the activity is scheduled to begin <u>except in 1990</u>. The National Marine Fisheries Service will publish notices of each request for a Letter of Authorization in the FEDERAL REGISTER <u>and effective November 1, 1990, there shall be</u> an opportunity for public comment <u>for those requests for Letters of Authorization submitted after that date.</u>

(b) An application for a Letter of Authorization must include the following:

(1) A plan to monitor the behavior and the effects of the activity on marine mammals;

(2) A plan of cooperation which describes the measures that have been and will be taken to minimize any potential conflicts between the proposed activity and subsistence hunting; and

(3) A description of the activity including the method to be used, the dates and duration of the activity, the specific location of the activity and the estimated area that will actually be affected by the exploratory activity.

(c) The National Marine Fisheries Service will evaluate each request for a Letter of Authorization based on the specific activity and the specific geographical location. Each Letter of Authorization will identify allowable conditions or methods that are specific to that activity and location.

(d) Any substantive modifications of the Letters of Authorization will be made only after notice and opportunity for public comment.

(e) Substantive modifications of the Letters of Authorization can be made without opportunity for public comment as provided in §228.38(c) if the National Marine Fisheries Service determines that an emergency exists which poses a significant risk to the well-being of the species or stocks of marine mammals concerned.

(f) The Letter of Authorization must be in the possession of the <u>person or</u> persons conducting activities that may involve incidental takings of marine mammals.

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Observations on the Ice-Breaking and Ice Navigation Behavior of Migrating Bowhead Whales (*Balaena mysticetus*) near Point Barrow, Alaska, Spring 1985

JOHN C. GEORGE,[1] CHRISTOPHER CLARK,[2] GEOFF M. CARROLL[1] and WILLIAM T. ELLISON[3]

(Received 28 January 1988; accepted in revised form 21 October 1988)

ABSTRACT. During a four-day period from 28 April to 1 May 1985, we observed bowhead whales breaking up through sea ice in order to breathe. Our observations were made from grounded sea ice approximately 10 km northeast of Point Barrow, Alaska, during the spring bowhead migration (14 April to 10 June). From acoustic and visual data, it was estimated that 665 whales passed the observation perches during this four-day period. However, only 117 (17%) whales were seen. The remaining whales either passed underneath the ice or were beyond the range of the visual observers. Whales used their heads, in the area of the blowholes, to push up against the ice (18 cm maximum thickness) and fracture it, creating a hummock of ice in which they were able to respire. Often during such breathing episodes, even at distances of only several hundred meters, the animal was not seen but its blows were clearly audible to the visual observers. Acoustic tracking of whales showed they avoided a large multi-year ice floe seaward of the observation perch. We hypothesize that bowheads use their calls to assess the thickness of ice in their migratory path. In assessing their calls, we suggest the whales can avoid areas where the ice is too thick to break through (to breathe) and/or too thick to provide clearance for them to swim beneath.

Key words: *Balaena mysticetus*, Point Barrow, bowhead whale, ice breaking, behavior, sea ice, singer, acoustic, anatomy, census

RÉSUMÉ. Au cours d'une période de quatre jours, du 28 avril au 1er mai 1985, on a observé des baleines franches qui remontaient à la surface en cassant la glace de mer pour respirer. Les observations ont été faites depuis la glace échouée, à un endroit situé à 10 km environ de Point Barrow, en Alaska, durant la migration de printemps des baleines franches (du 14 avril au 10 juin). D'après les données acoustiques et visuelles, on a estimé que 665 baleines sont passées près des perchoirs d'observation au cours de ces quatre jours. Cependant, seulement 117 baleines (17%) ont été aperçues. Le reste des baleines est passé soit sous la glace, soit trop loin des observateurs pour que ceux-ci puissent les voir. Les baleines se servaient de leur tête, dans la zone de l'évent, pour repousser la glace (épaisseur maximum de 18 cm) et la fracturer, créant un hummock de glace où elles étaient capables de respirer. Souvent, au cours de ces respirations, même à des distances de seulement quelques centaines de mètres, l'animal n'était pas visible mais ses souffles étaient nettement audibles pour les observateurs visuels. La surveillance acoustique des baleines montrait qu'elles évitaient un gros floe de plusieurs années, en direction du large à partir du perchoir d'observation. On émet l'hypothèse que les baleines franches se servent de leurs cris pour évaluer l'épaisseur de la glace sur le parcours de leur migration. L'évaluation de leurs cris nous amène à suggérer que les baleines peuvent éviter des zones où la glace est trop épaisse pour qu'elles puissent la casser (pour respirer) ou pour qu'elles aient la place de nager en dessous, ou les deux à la fois.

Mots clés: *Balaena mysticetus*, Point Barrow, baleine franche, casser la glace, comportement, glace de mer, chanteuse, acoustique, anatomie, dénombrement

Traduit pour le journal par Nésida Loyer.

INTRODUCTION

The Inupiat Eskimo whale hunters of arctic Alaska have known for centuries and, more recently, researchers have observed that bowhead whales have the ability to break relatively thick sea ice in order to breathe (blow) (Scammon, 1968; Carroll and Smithhisler, 1980; Fraker, 1984; Krogman *et al.*, 1986). Carroll and Smithhisler (1980) reported an incident in the early 1960s at Little Diomede Island during which John J. Burns observed an individual whale breaking ice 23 cm thick. Accounts by Eskimo whaling crews of bowheads breaking ice <20 cm are fairly common. However, in the 1930s a crew witnessed an unusual event in which a bowhead broke through ice approximately 60 cm in thickness about 6 km southwest of Barrow (H. Brower, pers. comm. 1988).

Bowheads likely begin their northward migration in March (during the maximal extent of the polar pack ice) from wintering areas in the Bering Sea en route to the Canadian Beaufort Sea (Braham *et al.*, 1980; Braham *et al.*, 1984; Miller *et al.*, 1986). Along the migratory route, they negotiate a tenuous system of leads (linear cracks in the sea ice), which often become refrozen or blocked by heavy multi-year ice (Ljungblad, 1981). Accordingly, in order for bowheads to extend their range into the High Arctic seas, morphological, physiological and behavioral adaptations to the ice-dominated environment, such as ice breaking and under-ice navigation abilities, would be expected.

Extensive observations of bowhead whales (over 8000 h of effort since 1978) have been made during the visual census of bowhead whales off Point Barrow, Alaska. During these observations, we have observed whales utilizing very small pools of open water, often just large enough to accommodate their blowholes. Sometimes, whales were detected by seeing or hearing only their distinctive blows (Carroll and Smithhisler, 1980; Dronenburg *et al.*, 1986).

In bowhead population estimates made from 1977 to 1984, it was assumed that under conditions when there was no open water (referred to as a closed lead condition), whales did not have access to openings in the ice for breathing and therefore would not migrate through the censusing area (International Whaling Commission, 1986; Zeh *et al.*, 1986a; Zeh *et al.*, 1986b).

However, during the 1984 spring census effort off Point Barrow, Alaska, a large number of bowhead whale calls (8958) were recorded throughout a four-day period, 3 May to 7 May, when the lead was closed by an extensive field of new and

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old ice. Acoustic location and tracking analyses were applied to a 31 h sample containing 2978 calls. These analyses revealed that, during the sample period, at least 139 whales passed, yet only three whales were seen (Clark *et al.*, 1986). These results clearly indicate that many whales can pass unseen through ice-covered leads. The results also indicate that the whales were (somehow) able to navigate through heavy ice and either find small openings or force their way through the ice to breathe.

Prior to our findings, there were no estimates of the numbers of whales migrating under the sea ice during spring migration, no detailed observations on how bowheads physically break sea ice, and no data on possible under-ice navigation techniques.

In this paper we describe (1) previously unreported observations of bowhead whales breaking ice for breathing holes and migrating through ice-covered water during April 1985. We present evidence that (2) many whales passed the census site unseen by visual observers and apparently (3) avoided swimming under a large floe of thick (10-20 m) multi-year ice. We also discuss the possibility that (4) bowheads use their loud (frequency modulated) FM calls as well as (5) visual cues to navigate around obstructions and to find areas of open water or thin ice.

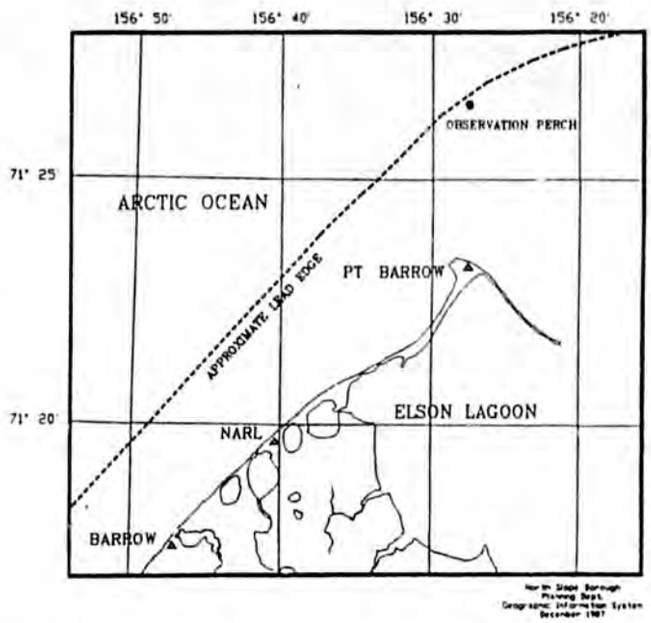

FIG. 1. The location of the observation site near Point Barrow during 27 April to 2 May 1985. The extent of the shorefast ice edge is indicated by a dashed line.

METHODS

We made whale observations from a grounded pressure ridge, or "perch," on the shorefast ice about 10 km north of Point Barrow, Alaska (71°26.10'N latitude and 156°26.05'W longitude) (Fig. 1). Two visual observation sites, referred to as perches, were located 335 m apart on the edge of the shorefast ice very near the lead system where the water depth was 30 m. During these observations a large floe of multi-year pack ice approximately 10 km^2 was fixed approximately 2.0 km seaward of the perches. New, thinner ice had formed around it, essentially covering the entire lead. The floe had characteristics of old multi-year ice (LaBelle *et al.*, 1983) (Fig. 2). Such ice often has keels greater than 20 m in depth.

We made whale observations in a manner consistent with those made in past years (Krogman and Rugh, 1983). Observers used a theodolite to determine the position of whales when they were at the surface (Clark and Clark, 1980; Rugh and Cubbage, 1980; George *et al.*, 1987). For each theodolite (whale) sighting, the time, group position, number in the group, and whether it was a new or duplicate sighting was recorded.

Acoustic technicians made multiple-channel (sound) recordings from an array of three hydrophones located along the lead edge (Clark *et al.*, 1986). Each hydrophone was cabled directly to an FM sonobuoy transmitter (Sippican Ocean Systems, Marion, MA) that broadcast the signals from the hydrophone on a separate radio frequency channel. These signals were received and recorded on a four-channel tape recorder (TEAC R-61D, available from: J. Wolfe Enterprises Inc., North Hollywood, CA) operating in a mobile research hut located on stable ice, approximately 1-2 km from the sonobuoys. Acoustic observers monitored hydrophones and "field tallied" readily audible whale calls in 15-minute bins through the entire day. Later the tapes were converted into continuous two-channel spectrograms on which all (many

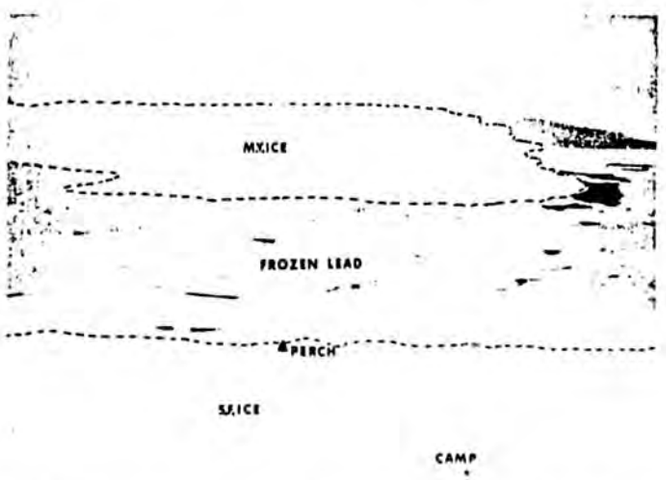

FIG. 2. Aerial photograph (looking northwest) of the sea ice in the region of the visual observation perch. A large multi-year ice floe (M.Y.ICE) was located ca. 2.5 km seaward of the shorefast ice (S.F.ICE). The region between is the refrozen lead through which the whales migrated. (Photo courtesy of David Rugh, National Marine Mammal Lab, Seattle, WA.)

calls were missed in the field tally) bowhead calls were identified and their times of occurrence noted. Attempts were made to locate all calling whales using a sound-location system (Clark *et al.*, 1986). After the sources of calls were located, the file of acoustic locations was processed by a program that linked the locations into whale swimming paths or tracks (Sonntag *et al.*, 1986). The southern and western margin of the multi-year ice (seaward of the perch) was determined by happenstance during a calibration experiment of the acoustic location system. In the experiment sounds were played into the water at various stations about 200-500 meters from the edge of the multi-year floe. We verified the station locations using horizontal theodolite bearings and

an electronic distance meter and approximated the overall shape of the multi-year floe by using aerial photographs.

Gentleman and Zeh (1987) combined the acoustic location and visual sighting data and, using a single mark recapture release model, estimated the number of whales that passed the census point during the study period.

RESULTS

Visual observations during the 1985 census operated from 9 April to 14 June, while acoustic surveillance extended from 14 April to 10 June. The first visual sighting and the first acoustic recording of a whale occurred on 21 April. The visual count for the entire season was 1251, and 22 007 calls were field tallied. A total of 3058 calls were field tallied during the four-day study period (Table 1). A summary of the daily observations and calls field tallied for the period from 27 April to 2 May is listed in Table 1. Combining the visual and acoustic data sets, Gentleman and Zeh (1987) estimated that 665 whales passed through the observation area during the 96-hour period beginning at 0000 h on 28 April and ending at 2400 h on 1 May.

TABLE 1. Numbers of whales sighted, calls field tallied per day and estimated number of bowhead whales passing Point Barrow between 28 April and 2 May 1985

Date	Whales sighted[1]	Calls/day[2]	Estimated whales[3]
4/27	1	22	–
4/28	6	1414	
4/29	79	642	235[4]
4/30	14	702	
5/1	18	300	430[5]
5/2	1	2	–
Totals	119	3082	665

[1]Whales sighted refers to those seen for the first time.
[2]Calls/day refers to the number of bowhead calls field tallied per day.
[3]The estimated numbers of whales were derived from the integration of visual and acoustic data (Gentleman and Zeh, 1987).
[4]Estimated whale passage for the period 00:00 on 28 April to 02:39 on 29 April.
[5]Estimated whale passage for the period 0.4:57 on 29 April to 24:00 on 1 May.

Ice-Breaking Behavioral Observations

From 15 to 21 April, in the region of the perches, there was an open lead of water but only one whale was seen. The lead began refreezing on 21 April, leaving 10-15% open water. However, 43 different whales were sighted in small areas of open water between 21 and 23 April. By 26 April observers estimated there was 1% open water. The new ice covering the lead averaged 14-18 cm in thickness. Beginning on 28 April and continuing until 1 May, an estimated 665 bowhead whales migrated past the perch (Table 1; Fig. 3). Virtually all of the whales must have either broken through the ice in order to breathe or used existing holes produced by earlier passing whales. That is, the lead was refrozen over several kilometers, which required the animals to surface in the refrozen zone. In breaking the ice, the whales slowly exerted pressure with the dorsal surface of their head (in the blowhole region) until the ice fractured (Fig. 4). To exert this pressure the whales likely used fluke and flipper strokes and/or their buoyant force. In breaking through the ice, the whales formed hummocks in the ice sheet. These hummocks were raised areas of fractured ice measuring approximately 1.0 × 0.7 m, with a ragged central opening of several cm^2 (Fig. 5). On one occasion a whale thrust its chin (lower mandible) through the ice. The animal's body was angled sharply upward as it broke the ice, thrusting its rostrum about 1 m above the ice. The whale then submerged and placed its blowhole into the fresh opening.

In several cases the whales' exhalations blew a muddy substance out of the hummocks. The mud bespattered the ice tens of meters downwind (Fig. 5). We inspected the underside of ice near two hummocks but found no mud.

Later whales repeatedly used many of the same hummocks over the four-day period, but these quickly refroze when the

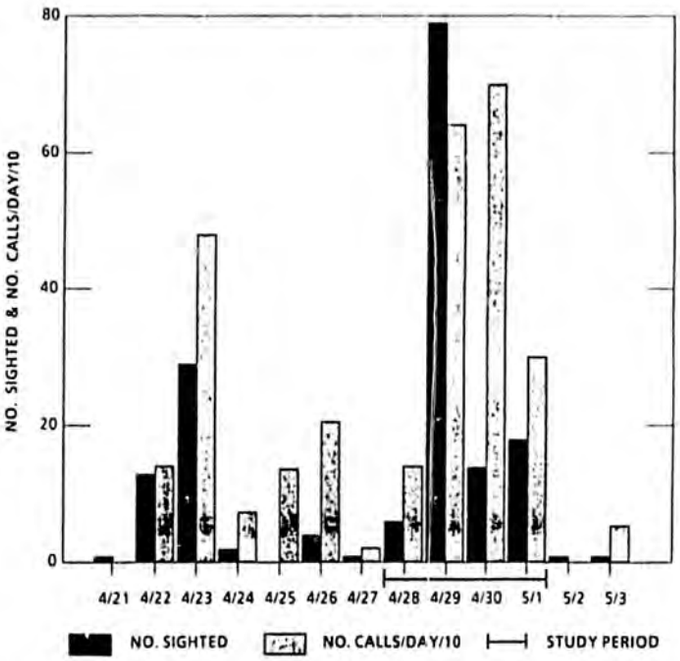

FIG. 3. Field counts of bowhead calls per day along with visual sightings per day made from the shorefast ice.

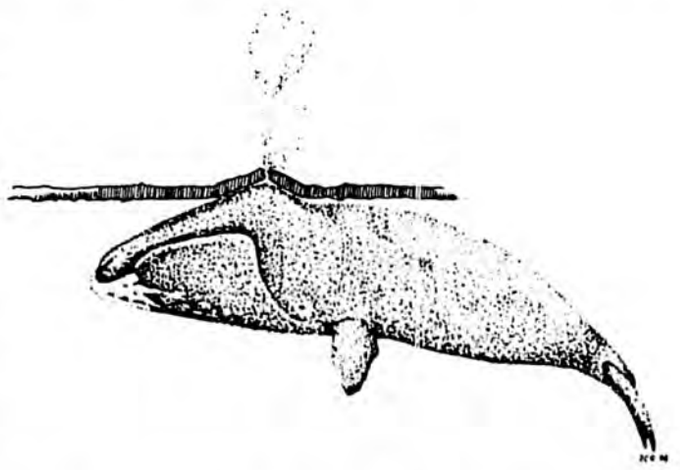

FIG. 4. Drawing of a bowhead whale using its protruding blowhole to break sea ice in order to breathe. (We could only see the whale's rostrum and approximated its body orientation for the drawing.)

FIG. 5. A photograph of a whale hummock measuring 1.0 × 0.7 m that was pushed up through ice 14.5 cm thick. There were 50-100 such hummocks in a 1 km^2 area seaward of the observation sight. The streaks and spatters around the hummock are bottom sediments blown out of the hummock during the whale's exhalation.

passage of whales temporarily ended on 1 May (Fig. 3). There were approximately 50-100 hummocks in a 1 km^2 area directly seaward of the observation perches. A few small pools of open water (100 m^2) were available, but the whales seldom made use of them.

On many occasions during this period, blows alerted us to the presence of whales that were never seen. During the study period observers sighted 117 out of an estimated 665 whales (17%) that migrated past.

Ice Navigation-Avoidance Observations

Of the 3058 calls field tallied (28 April to 1 May), 1422 were of sufficient quality to be located. Some of the calls were from "singing" bowheads (called singers), which called nearly continuously as they passed. We plotted the 1422 call locations (Fig. 6) and locations of calls from a single "singing" bowhead (Fig. 7). Examination of the plotted locations showed an obvious absence of calls that coincided with a large multi-year ice flow (Fig. 6). Similarly, when we plotted the singer track over the approximate boundary of the floe, the whale's course indicated it deflected around the floe (Fig. 7). Hence, to explain the absence of calls in Figure 6, we surmised that the whales avoided the multi-year floe during the study period.

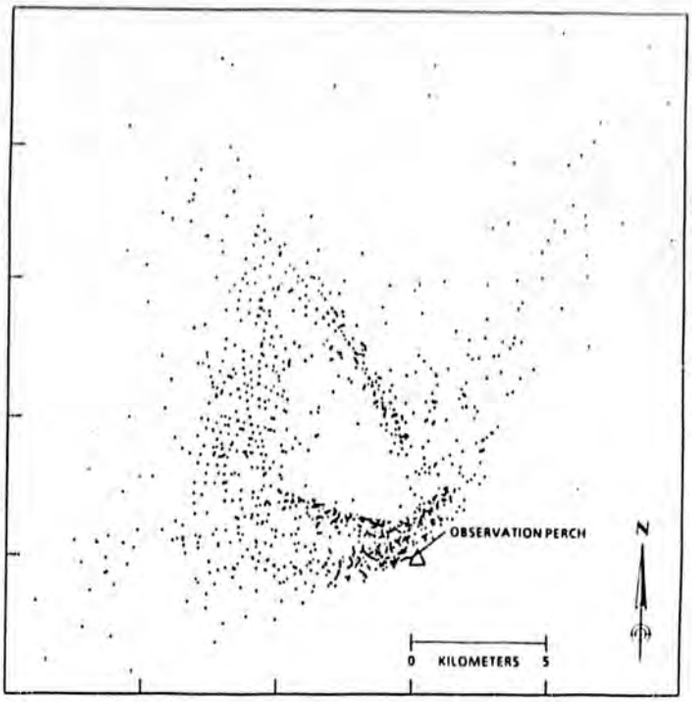

FIG. 6. Plot of the source locations of all calls from bowhead whales during the period 28 April through 1 May 1985 near Point Barrow, Alaska. The absence of calls in the center of the figure corresponds to the large multi-year ice floe. (The Y-axis is oriented to True North.)

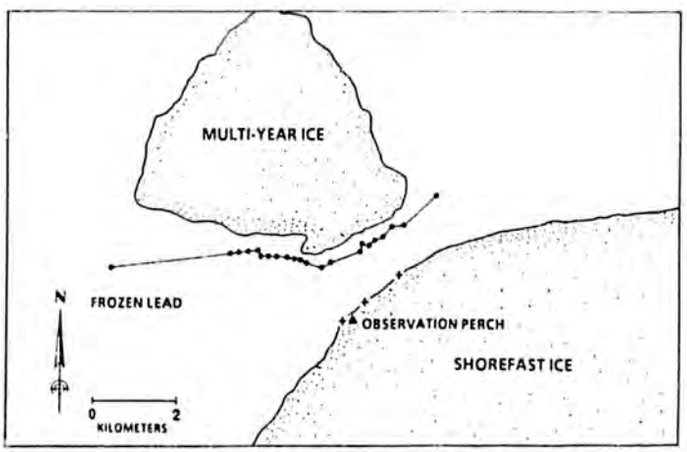

FIG. 7. Plot of "singing" bowhead track shows deflection around the multi-year ice floe that was seaward of the observation perch. The position of the multi-year ice floe was determined using aerial photographs and station positions made during a calibration test of the acoustic location system. (The Y-axis is oriented to True North.)

DISCUSSION

Ice-Breaking Behavior

Our observations confirm that bowheads can push up through ice to breathe, demonstrating one means by which whales breathe in waters entirely covered by ice. Bowheads also use existing cracks and very small holes to breathe.

The bowhead's protruding blowhole is likely an adaptation to an ice-dominated environment (Fig. 8). In support of this, the tissue between the external nares and the underlying rostral bone is composed of dense fibrous connective tissue up to 25 cm thick (Henry *et al.*, 1983). This tissue appears to be specialized for absorbing the impact experienced when breaking ice. We made close observations of feeding bowheads in late May 1985 and noted that the blowhole region in particular was roughened and abraded, possibly from ice breaking (Carroll *et al.*, 1987). We also regularly see abraded skin around the blowholes of whales landed by Eskimo hunters. Most bowheads have numerous scars on them, particularly on the dorsal areas of the head and on the flukes. Researchers and Eskimo hunters suggest that many

FIG. 8. A bowhead whale prior to sounding under landfast ice. Note the protruding blowhole showing several white scars. These wounds were likely ice inflicted. (Photo by Geoff Carroll.)

of these scars are ice-inflicted injuries (Albert *et al.*, 1980; Nerini *et al.*, 1984).

Other arctic and Antarctic cetaceans and some pinnipeds are known to break sea ice in order to breathe. Beluga whales (*Delphinapterus leucas*) can "maintain breathing holes and break through thin ice" (Hazard, 1988:206). However, there have been entrapments in which the belugas showed no ability to break thick (>60 cm) ice during an entrapment near Senjavin Strait (in the Bering Sea) (Ivashin and Shevlyagin, 1987). Pacific walrus (*Odobenus rosmarus divergens*) are capable of breaking ice up to 20 cm thick (Fay, 1982). However, walrus entrapped in stable multi-year ice have become "extremely emaciated" (Fay, 1982:238). Killer whales (*Orcinus orca*) and Ringed seal (*Phoca hispida*) have also been noted to break sea ice in order to breathe (Slijper, 1979; Kelly, 1988).

The ice that the whales broke through in 1985 was 14-18 cm thick. This ice easily supported the combined weight of three men and a heavily loaded sled and snow machine (approximately 500 kg). The ice was strengthened, in part, from the relatively low air temperatures (−17° to −6°C) during the study period (Cox *et al.*, 1984).

Although there were a few small pools of open water seaward of the perch, the whales made little use of them. This failure to use these open water areas contrasts markedly with past observations in which whales sometimes used very small pools of open water and did not break through ice (Carroll and Smithhisler, 1980).

It could not be confidently determined from visual sightings whether the animals were migrating or just milling in the vicinity of the perches. Aerial and acoustic data, however, indicated that the animals were migrating. On 2 May 1985, one day after the end of the intensive acoustic activity, an aerial survey was flown by National Marine Mammal Laboratory (NMML) personnel to locate and photograph whales. Researchers flew northeast up the lead system (which was open northeast of Point Barrow) and encountered groups of migrating whales from 114 to 208 km northeast of Point Barrow (NMML field notes, 1985). These whales likely migrated past the observation perch one to two days earlier.

The acoustic evidence that the whales were migrating during the study period was more convincing than the aerial sighting. The acoustic analysis consisted of 1422 acoustic locations for the period 28 April to 1 May and from singer tracks. Sonntag *et al.* (1986) present results from applying the tracking algorithm to the acoustic locations using several migration directions. The maximum number of linkages occurred between 65 and 85° (True heading), a value almost identical to the migration angle as determined from visual sightings before and after the lead refroze (Gentleman and Zeh, 1987). Tracks of singing whales indicate that singing bowheads were, in fact, moving (migrating) in the 65-85° direction. Singer tracks do not require the tracking algorithm and therefore provide an independent and more precise means of demonstrating migration.

Under-ice migratory behavior has important implications for population estimates of bowhead whales passing Point Barrow, Alaska. That is, this behavior in part explains the wide variation in visual counts between seasons, i.e., 669 in 1984 to 1888 in 1986 (George *et al.*, 1987). The low proportion of visual sightings during the study period (17%) is primarily a result of the ice cover obscuring the whales from the observers' view, although many whales acoustically recorded were also beyond visual range. Previous to the acoustic censusing efforts, it was assumed that very few bowheads were migrating during periods of heavy ice, since few if any whales could be seen. As a result of acoustic information, however, it is now known that many whales continue to migrate even during heavy ice conditions. For instance, during a 31-hour period in May 1984 when there was nearly 100% ice cover, at least 139 different whales were located acoustically when only 3 were seen (Clark *et al.*, 1986). In past years, the highest visual counts correspond with seasons during which the lead was generally open (George *et al.*, 1987).

While there is evidence that bowheads can migrate through most ice conditions, some conditions have blocked the northward migration of bowheads. In spring of 1980, Ljungblad (1981) made aerial observations of bowheads that were apparently blocked by continuous multi-year ice in the Bering Strait region. Consequently, the typical arrival date for bowhead whales at Barrow was delayed approximately one month (Johnson *et al.*, 1981).

Nerini *et al.* (1984) summarized historic literature regarding ice entrapments and drownings of bowhead whales. Several drownings, sometimes involving 10 or more animals in some cases, were reported in the Soviet Chukchi Sea, the Bering Sea, and Disco Bay, Greenland. In 1981 we observed a small bowhead (from 3 m away) that seemed to be entrapped in a closing lead filled with slush ice. Unfortunately, we had to evacuate the sea ice and do not know the fate of the animal.

Documented entrapments represent only a few cases over 200 years. They do, however, indicate that the bowheads' ability to assess ice conditions is not infallible. These observations further suggest (indirectly) that there is strong selection for adaptations that allow the bowheads to perceive a

variety of ice conditions, navigate through heavy ice, and find breathing areas during hazardous situations.

Ice Navigation-Assessment Behavior

Bowheads probably find breathing holes, small polynyas, and areas of thin ice through a combination of visual and acoustic cues. Several lines of evidence indicate that whales use ambient light for this purpose. The eye of the bowhead has a tapetum, which suggests that it is adapted to low-light conditions (Dubielzig and Aguirre, 1981). Such an adaptation would be useful for living in dark, turbid waters and, perhaps, for detecting cracks in the sea ice. Use of ambient light might explain the repeated use of the hummocks by different animals. We also observed, in a large ice pan (approximately 400 × 400 m), a single hummock precisely centered in a lone snow machine trail made hours earlier (Fig. 9). The snow machine compressed the thin snow layer onto the wet sea ice, causing the snow to melt and allowing more light to penetrate. The animal may have judged the track to be a small crack and broke through the ice beneath the track. The maximum distance at which a bowhead can detect a crack or other suitable breathing site remains unknown.

FIG. 9. A hummock from a bowhead whale that pushed up underneath a track made earlier by a snow machine. The ice was 18-20 cm thick in this area. The whale may have mistaken the track for a thin crack in the sea ice.

In addition to using ambient light, Ellison *et al.* (1987) suggest that bowhead whales may be able to assess ice conditions acoustically by using their FM calls. Their calculations show that the reflection of a bowhead call off the underwater keels of heavily ridged pack ice (10 m in thickness) is 20-30 dB greater than its reflection off new ice (0.25 m in thickness). Thus, a bowhead could determine where there is thin (flat) or thick (generally rough) ice ahead by perceiving the relative level of its own call as it is reflected off the ice. There is other circumstantial evidence that bowheads avoid thick-ridged ice based on the acoustic location data gathered during the 28 April to 1 May period. When all the whale call locations were plotted, they showed an obvious absence of acoustic locations northwest of the perch (Fig. 6). This paucity of call locations corresponds with the position of the large multi-year ice floe in front of the perch (Fig. 2). The absence of calling whales in the area of the floe implies that the whales either avoided swimming underneath it or swam underneath it but made no sounds. It would seem rather unusual for all whales to stop calling when they were underneath the floe, but we have no data on this subject. The floe may also have been grounded in places, preventing the whales from swimming underneath it. Furthermore one singer, for which there is an extensive track during this period, clearly changed its course while singing and swam around the floe (Fig. 6). The precise distance the singer was from the ice floe when it changed course could not be determined. Based on this evidence, we suspect that the whales detected the floe by perceiving the strength of their reflected calls off its deep walls and keels and swam around it. Though we can only suggest the use of reflected calls, it seems logical that such a huge animal as a bowhead whale migrating through turbid and/or dark waters would require some system to avoid collisions with deep ice keels.

A matter that is not entirely resolved is the source of sediments on the ice around the hummocks. This mud was probably on the whales' blowhole area when they respired. We have noted mud on blowholes of whales landed by Eskimo hunters. The Eskimo hunters and observations by Würsig *et al.* (1985) tell us that bowheads do, at times, swim in an inverted position. However, whales following each other through churned-up mud (via fluke strokes near the bottom) could become coated with sediments while upright. Aerial observers often see whales with mud on them in the Point Barrow area during spring migration (Carroll *et al.*, 1987).

All of the hummocks that we inspected had some amount of sediment in and around them. We cut two test holes in the surrounding ice 1-2 m from the hummocks to determine if the mud was specific to the hummocks or generally coated the underside of the ice. No mud was noted below the ice, which supports our feeling that the mud originated from the whales.

CONCLUSIONS

Our data indicate that large numbers of bowhead whales can travel underneath the ice and apparently can easily break ice less than 20 cm thick. Eskimo hunters, however, have witnessed bowheads break ice approximately 60 cm thick. This behavior, in part, explains the wide variation in visual counts at Point Barrow over the last 10 years and has significant effects on population estimates. There are, however, ice conditions that block the northward migration of bowheads. For under-ice navigation and avoidance of large multi-year floes, bowheads appear to use ambient light cues and, perhaps, the echoes of their calls off the keels of thick ice. The protruding blowhole is probably a morphological adaptation to living in ice-dominated waters and is used to break through ice in order to breathe. The substance that was blown from the ice hummocks by the whales' exhalations was likely bottom sediment that adhered to their blowhole area.

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Latitude 71° 18' N
Longitude 156° 47' W

Barrow, Alaska
Sunrise and Sunset for 1991

Alaska Standard Time

Nautical Almanac Office
U.S. Naval Observatory
Washington, D.C. 20392-5100

	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.	
Day	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
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2	****	****	1131	1552	856	1825	621	2043	329	2326	****	****	****	****	147	120	538	2113	748	1842	1019	1601	****	****
3	****	****	1124	1559	851	1829	616	2048	321	2334	****	****	****	****	216	052	542	2108	753	1838	1025	1555	****	****
4	****	****	1118	1606	846	1834	611	2052	313	2342	****	****	****	****	231	036	547	2102	757	1833	1031	1549	****	****
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8	****	****	1053	1631	826	1852	550	2111	235	011	****	****	****	****	313	2345	605	2042	815	1813	1057	1524	****	****
9	****	****	1047	1637	821	1857	545	2115	222	024	****	****	****	****	321	2337	609	2037	819	1808	1104	1517	****	****
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12	****	****	1030	1654	806	1910	529	2130	****	****	****	****	****	****	344	2315	623	2022	833	1753	1126	1455	****	****
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16	****	****	1008	1716	746	1928	508	2150	****	****	****	****	****	****	409	2249	640	2002	851	1733	1204	1419	****	****
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18	****	****	957	1726	736	1937	457	2200	****	****	****	****	****	****	421	2236	648	1952	901	1722	1232	1352	****	****
19	****	****	952	1732	731	1941	451	2206	****	****	****	****	****	****	427	2230	653	1947	905	1717	1300	1324	****	****
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21	****	****	942	1742	721	1950	440	2216	****	****	****	****	****	****	438	2218	701	1937	915	1707	****	****	****	****
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25	1238	1442	921	1801	702	2007	416	2239	****	****	****	****	****	****	459	2156	718	1917	935	1646	****	****	****	****
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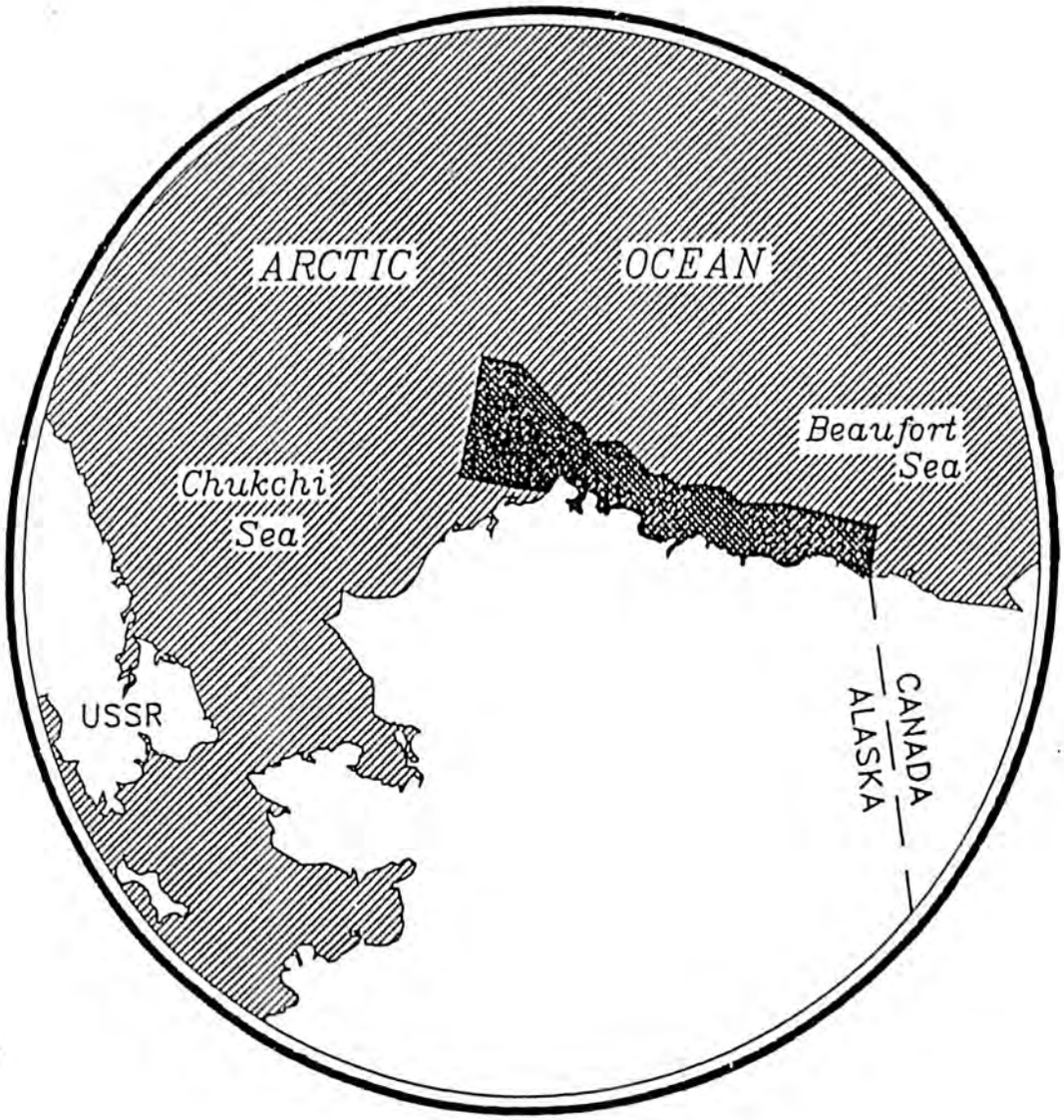
When sunlight, twilight, or darkness exceeds 24 hours, the beginning and end of such intervals are physically uncertain and no limits of precision can be stated. Add one hour for daylight time when and if in use. (**** = NO PHENOMENON)

OCS EIS/EA
MMS 90-0063

Alaska Outer Continental Shelf

Beaufort Sea Planning Area Oil and Gas Lease Sale 124

Final Environmental
Impact Statement



U.S. Department of the Interior
Minerals Management Service
Alaska OCS Region

ORTH SLOPE BOROUGH
FFICE OF THE MAYOR
. Box 69
row, Alaska 99723
one: 907-852-2611

George N. Ahmaogak, Sr., Mayor

May 8, 1990

Alan D. Powers
Regional Director
Minerals Management Service
949 East 36th Avenue, Room 110
Anchorage, AK 99508-4302

RECEIVED
MAY 22 1990
REGIONAL DIRECTOR, ALASKA OCS
Minerals Management Service
ANCHORAGE, ALASKA

RE: PROPOSED BEAUFORT SEA LEASE SALE 124

Dear Mr. Powers:

As should have been very evident from the testimony of our residents at the well-attended public hearings in Barrow, Kaktovik, and Nuiqsut on April 17, 18, & 19 respectively, the North Slope Borough remains strongly opposed to this proposed offshore lease sale. The reasons given for opposition to the sale by Borough and local officials, our elders, whaling captains and crews, wives and mothers, social and health workers, tribal representatives, biologists, and many others were varied, but together left little doubt about the local sentiment against offshore activities in the Beaufort Sea. We continue to believe that oil and gas leasing, exploration, and development should be restricted to onshore or shallow-water tracts, where proven techniques and technologies can be employed to significantly limit impacts from both day to day operations and catastrophic events. No one can yet make the same claim with respect to offshore operations requiring the use of drillships. These comments will be in two major parts; Section I will discuss our general position that leases should not be sold in the arctic OCS in waters which would require drilling from floating structures, and Section II will deal with specific provisions of the Sale 124 Draft EIS.

SECTION I. OCS LEASE SALES IN THE ARCTIC NOT SUPPORTABLE

We believe that the path from leasing to development is a downhill one; that a bias in the regulatory process increases the likelihood with each successive step that the following step will find approval. Recognizing this, we do not believe that the first step (leasing) should be undertaken unless and until firm assurances can be made, based on good scientific evidence, that the intermediate step (exploration) and final steps (development and transportation) can be undertaken safely and with minimal disturbance of wildlife and subsistence activities. Without that essential base scientific evidence, including a much broader understanding of arctic ecosystems, noise impacts, and the effectiveness of oil spill clean-up techniques in the region, the leasing and regulatory agencies are playing a high stakes guessing game with our shared biological heritage and the Inupiat culture. NSB 1

We are not alone in questioning the sufficiency and quality of the scientific information which has underlain federal and state decisions concerning offshore industrial activities. The Arctic Research Commission was created by the Arctic Research and Policy Act of 1984 (15 USCS § 4102) to "promote Arctic research and to recommend Arctic research policy", and is composed of five members appointed by the President. In December 1989 the Commission published a fourth in its series of FINDINGS AND RECOMMENDATIONS reports with the title IMPROVEMENTS TO THE SCIENTIFIC CONTENT OF THE ENVIRONMENTAL IMPACT STATEMENT PROCESS. The report states that the Commission undertook a review of the EIS process "(b)ecause accurate scientific and technical information and adequate data bases are such a fundamental requirement, and because the Arctic presents very unique environmental problems".(p. vii) The Commission identified an imperative need to improve the EIS process in several respects, but concluded that the "most critical deficiency is the absence of impartial external quality-control mechanisms for the data and information used in the stages of scoping, synthesis and EIS preparation, and the follow-up monitoring programs." (p. 1) While we urge you to carefully review and respond to the entire brief report before proceeding with this lease sale or permitting any other industrial activity on the Alaskan OCS, several of the document's findings and conclusions merit special mention here:

> p.5. The effects of man-made environmental insult are aggravated by the relatively small number of species in arctic ecosystems and the slowness of environmental recovery (environmental fragility). The result is that there are few comparable precedents on which to base EIS predictions in Alaska, and that the environmental consequences of erroneous predictions can be far more serious and long-lasting than in temperate regions. NSB 2

In the Arctic, including the Alaskan Arctic, there is a serious lack of data and information concerning the NSB 3

physical and biological (ecological) environment covering long periods of time, on a decadal scale. NSB 3

p.6. The scoping process is sometimes perceived to be organized to support decisions already made. NSB 4

EIS's are often viewed as supporting agency opinions rather than being the basis for such opinions. NSB 5

Too many nonverifiable hypotheses and unstated assumptions are included in the EIS, and much of the documentation is based on the "gray literature." NSB 6

p.11. To improve the EIS process, impartial external scientific and engineering review mechanisms should be established for each of the following three stages: The scoping plan; Synthesis and preparation of the EIS; and Environmental monitoring programs. NSB 7

Some decisions stipulate that an environmental monitoring program is to become part of the project. Peer review of the design of the monitoring procedures will help assure accurate and usable results.

Also instructive is the February 1990 final report of the laska Oil Spill Commission, entitled "SPILL: The Wreck of the xxon Valdez". While this report focuses primarily on the Prince illiam Sound tragedy, it also contains several important general servations, as well as specific recommendations concerning ntinued industrial activities in the arctic. We ask that you nsider the entire report and respond to these points before you roceed with this lease sale:

p.100. The consequences of the Exxon Valdez oil spill have brought into question the usefulness of existing oil spill containment and pollution-abatement technologies, not only for a catastrophic spill the size of that from the Exxon Valdez (10.8 million gallons) but also for any major oil spill in an offshore, remote or sensitive area. NSB 8

In general, none of the currently available technologies are adequate for these incidents. In the United States, almost all existing technology has been developed for use in harbors and other protected waters, not in offshore, remote or environmentally sensitive waters.

p.125. Conclusions reached for Prudhoe Bay were that in summer the spill response would be effective for small spills, but that there was insufficient equipment to contain and recover a large spill. Contingency planning at Prudhoe Bay relies heavily on the ARCAT skimmer, but there have been no tests to see how well it recovers oil, specifically how well it would recover highly weathered Prudhoe Bay crude. NSB 9

During fall at Prudhoe Bay the spill response in a growing offshore ice field would be only marginally effective with present equipment. Spill response on shorefast ice would not be easy, but there would be more time to marshal heavy equipment and personnel out on the ice where scrapers and front-end loaders could recover the pooled oil. During breakup there could be a period of several weeks in which the only action response crews could undertake would be to watch the interaction of the ice and the spilled oil.... NSB 10

The picture is bleak for remote areas. An effective response effort for a large spill from a drill ship or a tanker accident very far from Prudhoe Bay or Barrow would be extremely difficult...(u)sing airborne applications of chemicals, either dispersants or gelling agents, has received no testing whatsoever in these conditions, and none is known to work on heavy crude oils at typical arctic temperatures. NSB 11

p.144. The long-term need to develop environmental safety regimes of great stringency cannot be ignored. Development of arctic oil discoveries dependent on maritime transportation should await the preparation of approved systems of oil transportation using experience gained from the trans-Alaska pipeline system. NSB 12

p.201. The commission does not think that oil should be developed to production in any arctic area without a substantial planning effort on the transportation leg. NSB 13

We have long argued that drilling from floating structures, and therefore lease sale terms which would permit such drilling, are insupportable in arctic waters. You simply do not have enough good baseline scientific data to appropriately assess the environmental risks posed. You do not know how bowhead (and belukha) whales are impacted by industrial noise; just how vital their ability to communicate is to navigation in heavy ice NSB 14 NSB 15

conditions, whether heavy seismic activity has damaged the hearing of individual whales, whether whales have already been driven from traditional migratory and feeding areas, or if intense localized drilling, support, or seismic noise could act as a migratory barrier and subject a large aggregation of animals to increased risk from environmental hazards. You are not certain how whales and other organisms would be affected by exposure to spilled oil in the arctic environment; whether an entire migratory pulse of whales could be harmed by even a comparatively small spill which could not be avoided due to environmental conditions, how long oil and its toxic byproducts would persist and migrate in the cold and ice of the arctic, or how spilled oil would affect krill, mollusk, and fish populations, and the higher organisms which feed on them, including seals, walrus, whales, and man. You are unsure of industry spill response, clean-up, and containment technologies under ideal conditions and in accessible locations, much less in the harsh and remote environment of this proposed sale. All this and more is the information which must be known before the true risks of oil exploration, development, and transportation can be determined. Without really understanding these variables, rather than just paying lip service to them, you cannot know whether the risks outweigh, or are outweighed by, the supposed benefits which you also accept with little basis. We strongly recommend that the final EIS contain as a preferred alternative a sale which would only offer for lease those tracts in water depths which could be explored and drilled from islands or bottom-founded drilling structures. NSB 15

SECTION II. PREFERRED ALTERNATIVE AND PROPOSED MITIGATING MEASURES OF DEIS DO NOT ADEQUATELY PROTECT SALE AREA ENVIRONMENT OR SUBSISTENCE ACTIVITIES

As explained above, we do not believe any Beaufort Sea tracts should be leased which would require exploratory drilling to be conducted from floating structures. Drilling from floating structures, whether anticipated under the low, base, or high case scenarios offered in the DEIS, would not comply with the provisions of the North Slope Borough Coastal Management Program prohibiting (1) significant interference with subsistence whaling, (2) jeopardy to the continued availability of whales for subsistence, (3) depletion of subsistence resources below the needs of local residents, (4) preclusion of reasonable access to subsistence resources, and (5) noise disturbance in areas of concentrated wildlife, and those provisions requiring effective oil spill control and clean-up plans. Our belief that drilling cannot now be conducted from floating structures with the required assurances of safety and non-interference with wildlife and subsistence NSB 16

activities is reflected in the Offshore Drilling Policy contained in the revised Land Management Regulations recently adopted by the Borough Assembly. NSB 16

The debate over the need for, and scope of, any seasonal drilling restriction (SDR) to protect migrating bowhead whales has often dominated the discussions preceding previous Beaufort Sea lease sales, including Sale 97, held in March 1988. We have consistently argued that the burden falls on those desiring to lease and explore offshore tracts to prove that exploration, development, transportation and related activities will not have an adverse impact on these endangered animals or the subsistence harvest. To its credit, the State of Alaska has acknowledged the potential threats posed by industrial activities, and has recently adopted a revised Beaufort Sea SDR. This new policy, unfortunately, only addresses potential noise impacts, and has left to a later date further improvement of measures to minimize oil spill threats. NSB 17

The SDR embodied in our Offshore Drilling Policy, though applicable directly only in State waters, addresses both noise and oil spill threats, and will be our guide in any consistency review of proposals in federal waters as well. The policy is as follows:

19.70.040 Offshore Development Policies. The following policies are intended to guide the approval of development and uses in the portion of the Beaufort Sea within the Borough boundary. Case by case extensions to the time periods below may be granted during approval or as a use permit if the activity will not significantly impact subsistence activities, will have minimal environmental risk, and all review agency comments have been addressed.

A. Drilling shall be conducted from bottom founded structures.

B. Drilling above threshold depth may occur year-round.

C. Drilling below threshold depth shall be conducted during the winter (November 1 through April 15) and be completed as early in this period as practicable.

D. Confirmation, extension or delineation drilling, well testing and other well completion activities shall be completed by June 15. Consistent with C above, any additional drilling or other activities shall not penetrate any new oil or gas bearing formations, or significantly increase the risk of an oil spill.

E. All nonessential boat, barge and air traffic associated with drilling activity shall occur prior to or after the period of whale migration through the area. Essential traffic (traffic that could not reasonably occur prior to or after the period of whale migration through the area) shall avoid disrupting the whale migration, subsistence activities, and be coordinated with the Alaska Eskimo Whaling Commission.

F. Year-round drilling can occur following the unitization and approval of the Plan of Operation and Borough approval of a Master Plan and rezoning to the Resource Development district for the proposed development.

By comparison, the proposed Stipulation 8 of the DEIS falls NSB 18
ort of providing adequate protection for whales, other wildlife sources, and the subsistence harvest. While if imposed, the ipulation is an incremental step in the right direction for MMS, s time frames are not restrictive enough, drilling from floating ructures is permitted when adequate spill response capability es not exist, and it fails to address the potential cumulative pacts of development.

Alternative I is unacceptable in other respects as well. Both NSB 19
e Barrow and Kaktovik Deferral Areas should be removed from nsideration for this proposed sale and future sales. You should fer to our October 27, 1988 comments during the scoping process r Sale 124, and again to our Sale 97 comments, for extended scussions of the need to defer these areas. The Spring lead stem around Barrow remains a unique and sensitive area of ncentrated biological diversity and subsistence activities. ough the DEIS states that the risk of oil contact with bowheads low, we think it is clear that the consequences of an oil lease into the Spring lead system could be catastrophic. The ring Sea stock of bowheads typically migrates though a very nfined area (Pt. Franklin, Pt. Hope, Pt. Barrow) in a relatively ort period of time. In some years (e.g. 1980 and 1988) more than % of the population may move past Point Barrow in less than two eks. This behavior, and the nature of the confining lead system self, could make a dangerously high percentage of the population lnerable to harm should oil be released or persist in this gratory corridor.

As we stated in our previous comments, you should accept as NSB 20
ue the long-held Inupiat belief that the waters to the east of rter Island are an important bownead feeding area. So often in

the past, outsiders were slow to accept Inupiat claims about their environment which were later proven correct only after much time-consuming and expensive research. In addition, information NSB 20
available only since our last comments has indicated the importance of the ANWR coastal plain and adjacent waters to denning polar bears. With the continued closure of ANWR to industrial activity, far greater consideration must also be given to the difficulties of oil transportation over extended distances offshore before tracts in the eastern Beaufort are leased. NSB 21

In addition, the DEIS understates the potential negative cumulative impacts of oil exploration, development, and transportation. The document states that in the cumulative arctic case, there is a 99% chance of an oil spill in excess of 1000 barrels, with it most likely that there will be eight such spills. Looking at only the Beaufort Sea, the probability of one or more spills of at least 1000 barrels is stated to be 49% in the base case, and 91% in the high case. These are disturbing predictions to our coastal residents who subsist largely off the resources of the ocean. NSB 22

The DEIS also states that since 1964, there have been twenty OCS spills of greater than 1000 barrels. While this is touted as an impressive statistic, it means to us that the eight spills predicted for the arctic represent a number of incidents equal to a full 40% of those occurring on the entire OCS over a period of 26 years. Unless arctic activity is expected to be at a level approaching 40% of all OCS activity over the past 26 years, it appears that MMS is anticipating greater difficulty in operating safely in the arctic than has been experienced elsewhere. Coupled with the far greater difficulty in responding to such significant spills in the arctic, we have little confidence that we should not expect significant cumulative impacts over the life of arctic OCS development. NSB 23

There is also information available, but not discussed in the DEIS, which should raise serious concerns over the possibility that vastly increased vessel traffic associated with development could impact the bowhead population. The Borough has documented scarring on whales which is believed to be the result of collisions with ships. The incidence of bowhead/ship collisions appears to be low (ca. 2%), and is probably not a significant source of mortality for the Bering Sea stock. This low rate is most likely attributable to the low level of vessel traffic within their range. Socializing right whales, however, have been found particularly vulnerable to collisions when they become apparently oblivious to approaching NSB 24

vessels (Goodyear 1989).[1] That the same may be true of bowheads is evident in film recently shot by scientists having just completed a tagging effort in the eastern Beaufort Sea. Individual animals repeatedly collided with their vessel while the boat moved among a large aggregation of apparently socializing and feeding bowheads. NSB 24

Ship collisions are not infrequent for the North Atlantic Right Whale (NARW), a species closely related to the bowhead. Kraus (1990) has found evidence that perhaps 33% of NARW mortality is human induced, and that ship collisions are a significant problem.[2] He suggests that such human-induced mortality may be preventing recovery of the NARW stock despite a more than 70-year ban on commercial hunting. Our concern is that increased vessel traffic, including ice breakers operating in lead systems, will lead to a dangerous increase in the incidence of bowhead/ship collisions. NSB 25

SECTION III. CONCLUSION

We have discussed the State of Alaska's position on the Sale 124 DEIS with agency officials, and agree with much of their analysis regarding the shortcomings of the document's proposed mitigating measures and the need for the Barrow and Kaktovik Deferrals. Because our position, however, is that lease tracts should not be sold in waters which cannot be explored and drilled from bottom-founded structures, we find it unnecessary to comment on much of the DEIS. We do ask that you carefully consider and where appropriate, specifically respond to, the comments of those who testified at the public hearings in our villages. The elders who spoke particularly deserve a response to their concerns that bowheads and other subsistence resources have already been significantly displaced by industrial activity, and that current technology can neither withstand worst-case ice and weather conditions, nor deal with significant oil spills in this environment. You should respect the fact that no one knows this environment better than its Inupiat residents, and no one will

[1] Goodyear, J. 1989. Feeding ecology, night behavior, and vessel collision risk of Bay of Fundy right whales. In: Abstracts of the Eight Biennial Conference on the Biology of Marine Mammals. Available from: The Marine Mammal Society.

[2] Kraus, S. 1990. Rates and potential causes of mortality in North Atlantic right whales. Marine Mammal Science. (In press).

suffer more if your best guesses as to the potential impacts of offshore oil development prove wrong.

Thank you for this opportunity to comment.

Sincerely,

George N. Ahmaogak, Sr.
Mayor

cc: Steve Cowper, Governor
Ron Morris, NMFS
Mayor Don Long, Barrow
Mayor Thomas Napageak, Nuiqsut
Mayor Herman Aishanna, Kaktovik
Dan Fauske, Acting CAO
Warren Matumeak, Director, Planning
Ben Nageak, Director, Wildlife Management
Edward Hopson, Chairman, AEWC
Jessica LeFevre, AEWC Attorney
Elizabeth Benson, Division of Governmental Coordination
Dennis Roper, Federal Affairs
Anthony Kesler, State Affairs
Eugene Brower, President, BWCA
Tom Albert, Borough Senior Scientist
Tom Lohman, Assistant Borough Attorney

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receive statements on actions of the kind proposed.

The agencies, institutions, groups, and individuals that were sent copies of the DEIS for review and comment are listed in Section VI.C. The distribution of the Sale 124 DEIS provides an opportunity for many individuals from many professions—including the natural and social sciences, legal, regulatory, health care, and engineering, as well as private citizens—to comment on the adequacy of the statement, merits of the alternatives, or both. Responses to comments received might include the following: (1) modifying alternatives, including the proposed action; (2) developing and evaluating alternatives not previously considered; (3) supplementing, improving, or modifying the analyses; or (4) making factual corrections. The MMS considers this review and comment process ensures a full and fair analysis of the potential effects that the proposed oil and gas lease sale might have on the environment. The scoping process is part of the EIS process and thus subject to review, comment, and responses as are other parts of the EIS.

Monitoring programs are developed in conjunction with other Federal agencies and with State and local agencies that either have jurisdiction with respect to the program by law or special expertise or are authorized to develop and enforce environmental standards. The MMS considers that the consultation process used to develop monitoring programs will result in the acquisition of information to address the environmental concerns the programs are established to monitor.

NSB-8:

The quoted conclusion from the Alaska Oil Spill Commission is consistent with the analysis of effectiveness of oil-spill response in Section IV.A.2. The analyses of effects in this EIS do not assume mitigation through response efforts. See also Response MMC-16.

NSB-9:

The "large spill" discussed by State of Alaska, AOSC (1990), was an instantaneous, unconfined spill of 50,000 bbl. By "effective," the AOSC meant recovery of at least the bulk of the spilled oil. It is unlikely that effective recovery would occur for such a spill anywhere offshore, much less than in Prudhoe Bay. Such effectiveness is not presumed in this EIS as discussed in Section IV.A.2. The AOSC conclusion is based more on circular reasoning than on an analysis (State of Alaska, AOSC, Appendix L, p. 4, regarding a Prudhoe Bay-spill response): "For large spills, there probably would not be enough equipment to contain and recover the oil so large quantities of spilled oil would escape into the environment. It is never possible to anticipate exactly how much recovery equipment will be necessary for spill response, but experience has shown that there is never enough."

The likely effectiveness of the ARCAT skimmer in recovery of highly viscous crude (such as weathered Prudhoe Bay crude) is discussed in Section III.D of Appendix M in this EIS. Rope-mop skimming devices, such as used by the ARCAT, are generally more effective with higher viscosity oils than with lower viscosity oils. Part of the concern of AOSC with the ARCAT is based on an assumption that Prudhoe Bay crude at 0 °C (32 °F) is near its pour point (temperature at which oil will no longer flow). The pour point of Prudhoe Bay crude is actually much lower, -23 °C (-10 °F) (Payne et al., 1984a).

NSB-10:

Potential response efforts during freezeup and breakup are discussed in Section IV.A.2 and Appendix M (Sec. III.E) of the EIS. Figure IV-A-2-4 summarizes the applicability of oil-spill-response techniques in the proposed sale area. There are few response options for both breakup and freezeup, and these are undemonstrated in the Arctic. Complicating matters, spills frozen into winter multiyear ice—the dominant winter-ice form in the sale area—would gradually melt out during the following summer, with about 10 percent of the oil not melting out until a second summer. In a freezeup spill, the spilled oil would be scavenged by grease ice and would either have to be mechanically separated from the ice or removed with the ice for recovery. Once the grease ice solidified, the oil would be trapped within the ice matrix and would be recoverable only by cutting and removing the ice or by waiting until meltout the next summer. In addition, landfast ice beyond about a 10-m water depth does not dependably thicken sufficiently to allow mobilization of heavy equipment until January. Thus, heavy equipment may not be usable for up to a 3-month period during fall freezeup and early winter.

The most effective procedure for spills during both freezeup and breakup may be to wait and ignite pools of oil on the ice as they form during the following breakup and summer(s).

NSB-11:

Crude tankers are not anticipated to be used for oil shipment in the Beaufort Sea Planning Area for either the Proposal or the cumulative case. Response would be difficult. As a rule of thumb, logistical constraints (e.g., fuel versus dispersant loads, flight and loading times, number of daylight and weather hours, airfield locations) may restrict effective aerial application of dispersants to spills within 50 nmi of land. There have been unsuccessful dispersant field tests—only partly attributed to cold-water effects—in the Canadian Beaufort Sea, resulting in the recommendation that dispersants not be considered a primary response tool in the Arctic (Swiss and Vanderkooy, 1988).

NSB-12:

The system used to transport any commercial oil discoveries will depend on where the oil is discovered and the environmental features at and near the discovery site: the amount and characteristics of the oil; the relative costs of constructing, operating, and maintaining various systems that might be used; regulatory requirements; and the possible use of existing transportation systems. Existing transportation facilities that might be utilized to transport any oil from the Beaufort Sea Planning Area might include TAP, the Kuparuk or Endicott Pipelines, and tankers from the Marine Terminal in Valdez, Alaska; these are approved facilities.

Before production can begin on a lease, the lessee must submit a Development and Production Plan to MMS in accordance with the requirements of 30 CFR 250.34. The plan must include a description of the means proposed for transportation of oil and gas to shore, the routes to be followed by each mode of transportation, and the estimated quantities of oil or gas, or both, to be moved along each route. After the plan has been deemed submitted, copies are sent to the Governor or the Governor's designated representative and also to the CZM agency of each affected State as well as the executive of each affected local government that requests a copy. Copies of the plan must be made available to appropriate Federal agencies, interstate entities, and the public. Comments and recommendations are submitted to MMS and are processed in accordance with regulations in section 30 CFR 250.34 and regulations governing Federal CZM consistency procedures, 15 CFR Part 930. A development and production plan may be (1) approved; (2) modified if it determined the lessee has failed to make adequate provisions for safety, environmental protection, or conservation of resources; or (3) disapproved if:

TELECOPY COVER SHEET

Barrow Legislative Information Office

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TO: (H) SPEC. COMM. ON OIL + GAS FAX: 465-2864 PHONE: _____

FROM: MARIE ADAMS - MEMBER, ALASKA + INUVIALUIT BELUGA WHALE COMM. PHONE: 852-2611

INSTRUCTIONS: WRITTEN TESTIMONY AS MS. ADAMS WAS UNABLE TO TESTIFY AT 4/8 TELECONFERENCED HEARING DUE TO COMMITTEE'S TIME CONSTRAINTS.

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SENT BY: PJohn

Comments on House Joint Resolution No. 36
Marie Adams

Thank you for this opportunity to comment on the House Joint Resolution No. 36 relating to off-shore oil activities in arctic waters. My name is Marie Adams. I have been involved with marine mammal issues in the north slope for over ten years, first as Executive Director of the AEWC and currently with the Alask Marine Resource Commission and the Alaska & Inuvialuit Beluga Whale Committee organized in 1988 because of the concerns local hunters and researchers had about beluga whales in Alaska.

First of all, I want to express my deep concerns about the ability of the oil industry to clean up an oil spill in arctic conditions. The oil companies who operate in the arctic have impressive oil spill contingency plans in place on paper. However, in 1988 when the much publicized gray whale rescue attempts were being made local, state, federal representatives including the oil companies and the Russian ice breakers tried to help. The heavy equipment that was stored in Prudhoe Bay to help clean up an oil spill, in the event such a thing happen, were deployed to assist in the rescue effort and everyone waited to see what would happen. The equipment failed miserably. This equipment was too heavy and cumbersome and could not be easily transported.

The local residents who are most familiar with the arctic conditions came up with a way of getting the whales through the ice with the least amount of harm to the whales. I have no faith in the industries abilities since none of their equipment has been demonstrated to be effective in realistic arctic environmental conditions.

This leads me into the other area of concern, the local knowledge of experience whaling captains and hunters and researchers continue to be over looked. I would like to see our local experts actively participate in the assessment of the oil industries ability to clean up an oil spill. This includes monitoring oil spill clean up drills that the state calls for occasionally to see if the oil industry is ready to respond to a spill. Until I hear the assessment of the industries capabilities from our own local experts, I will not be at rest with this issue.

Finally,the House Joint Resolution number 36 which I strongly support is a call for fairness. President Bush called for a halt of offshore oil and gas lease sales in the lower 48 where there has been decades of experience in dealing with offshore oil and gas exploration and development. I can not understand why the arctic was not initially considered. It would seem appropriate to evaluate whether or not the oil spill plans will work in relatively unspoiled arctic waters.

Thank you.

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(3) Locally Available Spill-Cleanup Equipment: The MMS, Alaska OCS Region, requires a lessee who wishes to drill to have an initial spill-response capability of 1,000 bbl per day. To date, during drilling of exploration wells in the Beaufort Sea, this requirement has been met with equipment warehoused at Deadhorse by ABSORB and with equipment positioned onsite by individual lessees.

(4) Mobilization Time: The MMS, Alaska OCS Region, requires that initial mobilization and deployment of response equipment be undertaken within 6 to 12 hours of a spill, geography permitting. However, the spiller must be prepared to respond before the spill reaches shore (in less than 6 hours, if necessary). Only onsite equipment and that which could be transported from Deadhorse by helicopter could meet this guideline for deployment for most of the sale area. The limited geographic and temporal presence of open water and slow vessel speeds in broken ice would preclude timely transport of spill equipment by sea. For large spills--those that could exceed the local cleanup-response capability--the MMS, Alaska OCS Region, requires that additional equipment be made available onsite within 48 hours. Additional response equipment to handle a large spill would be available from a multitude of sources.

Equipment stored at Deadhorse or airlifted to Deadhorse would be capable of meeting the criteria of the 48-hour-response time set by MMS. Additional, slower arriving equipment would still be useful in case of a major spill; but MMS would not consider such equipment in judging whether oil-spill-contingency plans met the MMS 48-hour-response criteria. Once spill-cleanup equipment reaches Deadhorse or Prudhoe Bay, it could be transported relatively quickly to the spill site only if it could be carried by helicopter and then only if weather permitted. A helicopter could reach any point in the sale area within 3 hours.

(5) Effectiveness of Oil-Spill Cleanup At Sea: The 6-to-12-hour and 48-hour response times required of drilling lessees by the MMS, Alaska OCS Region, are mobilization and deployment requirements. Cleanup would continue as long as necessary, without any timeframe or deadline. For example, a winter spill in pack ice might require initial onsite response followed by further cleanup of oil melting out and pooling on top of the ice in late spring or summer.

Mechanical cleanup at sea is usually much more effective on low-viscosity or medium-viscosity oils than on high-viscosity oils. A low-viscosity oil could be a diesel or a fresh, light crude. A medium-viscosity oil could be a lubricating oil or a light, flowing emulsion. A high-viscosity oil would be a weathered crude, bunker oil, or thick emulsion. An oil such as Prudhoe Bay crude would initially have low viscosity but would quickly weather and form a high-viscosity emulsion.

Because of natural dispersion, oil slicks in the open ocean are seldom tracked for more than about 10 days before the oil becomes too dispersed to locate or identify as a slick (USDOI, MMS, Gulf of Mexico [GOM] OCS Region, 1983). Out of necessity or otherwise, natural dispersion has frequently been the chosen response technique in Alaskan waters.

Uncontained burning also is a possible spill remedy. Experiments suggest that burn efficiencies on the order of 50 to 60 percent may be possible if the spill can be immediately set on fire (Laperriere, 1984). However, any delay in ignition would decrease combustion efficiency. The effectiveness of mechanical recovery and in situ burning of spilled oil at sea decreases rapidly with increasing sea state (roughness of the sea), while the effectiveness of dispersants and natural dispersion increases. Mechanical cleanup becomes nonfunctional between International Sea States 3 and 4. Question 1

During the months of July through September in the small fraction of the Beaufort Sea Planning Area with open water, sea states of 3 or greater occur from 13 to 30 percent of the time, and sea states of 4 or greater occur 9 to 18 percent of the time. Ice cover the remainder of the year would eliminate both high sea states and standard uses of most mechanical-cleanup equipment.

The review of the historical record of oil-spill cleanup at sea as contained in Section IV.B.5 of the Final Regional EIS (USDOI, MMS, GOM OCS Region, 1983) is incorporated by reference; a summary of this review follows. Offshore containment and cleanup are major tasks. Weather, sea conditions, and crew fatigue become critical factors; and cleanup at sea is generally only marginally effective. Recovery of oil usually ranges between 5 percent and 15 percent of that spilled. For example, in the Exxon Valdez oil spill, at-sea recovery of oil was estimated by Exxon at 0.01 percent through the first 2 weeks and 7 percent through the first 3 weeks (Oil Spill Intelligence Report, 1989a,b). Inshore (harbor) containment and cleanup operations generally occur in calmer waters and closer to logistical bases. Inshore operations are, therefore, more effective, with recovery of spilled oil on the order of 20 to 50 percent.

SALE 124 EIS

Historical demonstrations of the effectiveness by actual spill-response efforts in the Beaufort Sea are few and disappointing. Crowley Barge Tanker 570 spilled 1,600 barrels of heating fuel near Flaxman Island on August 20, 1988, apparently after ice ruptured one tank on the barge, with the leak not being immediately detected. Oil-spill-response equipment was mobilized from Barrow and Deadhorse, but an overflight was unable to locate any spilled fuel and none was recovered. In September 1985, an exploration spill of 2,440 bbl of diesel occurred from the Minuk I-53 artificial island in the Canadian Beaufort Sea during an intense storm (Birchard and Nancarrow, 1986). Plans were made only to apply dispersants and only if the slick approached shore. The slick did not approach shore, and 4 days after the storm ceased the slick had disappeared through natural dispersion and evaporation. No fuel was recovered. Canadian researchers released a total of 63 bbl of crude in field dispersant tests in the Canadian Beaufort Sea in August 1986 (Swiss and Vanderkooy, 1988). Application of even extremely high, up to a 1:2 dispersant-to-oil ratio, did not increase the rate of dissipation of the crude over that caused by natural dispersion on an untreated control slick.

(6) Effectiveness of Oil-Spill Cleanup in Ice: When a spill is dispersed far from its source or when ice is moving, containment and cleanup are more difficult. Planning of effective surface response with mechanical equipment to spills in pack ice has generally required that an icebreaker (or icebreaking-supply ship) be locally stationed in summer as a dedicated oil-recovery vessel (see Appendix M). An on-station icebreaker also would be necessary in winter.

This confidence in burning is unsupported by any evidence

In situ burning of spilled oil during heavy ice periods may be a more promising approach. Exposed oil would be ignited whenever possible. Existing response capabilities are more effective on landfast ice than on broken or pack ice. Spills in the latter two sorts of ice would be easiest to burn if the spill were contained within a small area close to its source. The ice itself can be useful in restricting the spreading of the oil, keeping the oil thicker and more amenable to burning. Experiments conducted to date indicate that in situ burning should be a more effective technique for spill response in the Arctic than is mechanical recovery in more temperate climates.

winter is easier than broken ice - slick presents risks safety as well as technical difficulties

The presence of landfast ice may actually improve response effectiveness by limiting the movement and spread of the oil and by providing a safe work platform for the cleanup. The only documented success story for offshore spill response in the Beaufort Sea was a planned experimental spill under landfast ice in the Canadian Beaufort Sea (Buist, Pistruzak, and Dickins, 1981). In this exercise, a total of 119 bbl of crude were spilled under landfast ice three times during the winter to simulate undersea oil blowouts. The following spring, 79 percent of the residual weathered (unevaporated) oil was manually recovered or burned as the oil surfaced on the ice prior to breakup. In winter 1977, 140 bbl of No. 2 diesel were spilled from an onshore tank at Nome, saturating adjacent snow and soil, with some diesel penetrating the ice cover of the Snake River (Allen, 1978). One-third of the spill was recovered, half of this amount by rope mops extended below the ice cover on the Snake River.

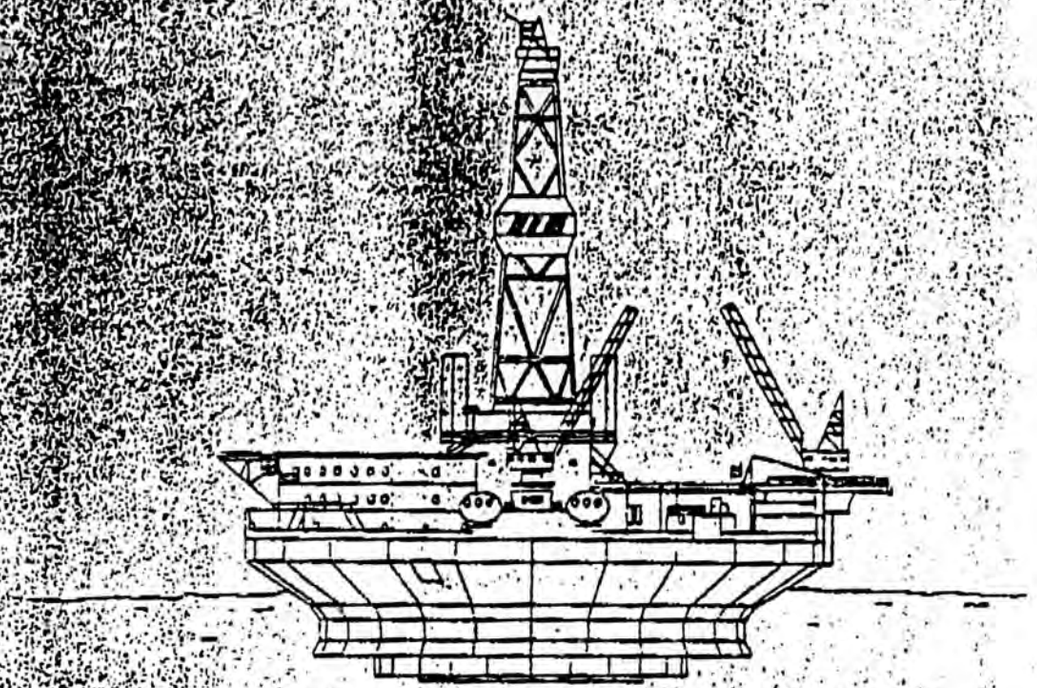
Spill-response efforts in the pack ice zone covering 90 percent of the sale area are undocumented and more problematic, particularly in winter. The January 1984 Cepheus spill of aviation fuel into broken ice in Anchorage harbor illustrates one problem with spill response in broken ice (USDOI, MMS, Alaska OCS Region, 1985a). The Coast Guard attempted to monitor movement of 5,000 bbl of spilled fuel by several techniques, only to conclude that none of the available state-of-the-art techniques could distinguish spilled aviation fuel from broken ice. None of the fuel was recovered.

Subarctic Prince William Sound is much more logistically accessible and protected than the open pack-ice zone in the Beaufort Sea Planning Area; yet even shoreline cleanup operations for the Exxon Valdez spill were stopped in mid-September 1989 out of concern for worker safety during the cold and dark winter.

In the Bering Sea, the F/V Milos Reefer grounded on St. Matthew Island in November 1989, spilling at least 5,600 bbl of its 9,000 bbl of mostly bunker and diesel fuel (Akre, 1989a,b,c). Poor weather and logistics ended up prohibiting a response, even though response vessels did reach the site. The initial response vessel, the USCG cutter Midgett, took 6 days to get to the site; the second response vessel, the Fireball, coming from Kodiak with the bulk of the response equipment, arrived onsite 11 days after the spill. No cleanup or offloading of the still-leaking ship was attempted in 1989 because of the severe weather and approach of winter, and any further efforts have been deferred until summer 1990, following the retreat of the Bering Sea seasonal ice pack.

Exploration Plan

OCS Lease Sale Areas 109 and 97
Chukchi and Beaufort Seas, Alaska



Prepared for

Texaco Producing Inc.

Anchorage, Alaska

Prepared by

ENSR Consulting and Engineering

Anchorage, Alaska

April 1990

TEXACO

During the ice-free period (July through October), storm surges do occur in the prospect areas. However, severe surges appear uncommon; a surge of 3.5 m (19 ft) occurred at Barrow in October 1963 and was thought to depict a 125-year event. Surges of 2 to 3 m (6 to 10 ft) are considered 10-year events (Brower et al., 1988).

10.5 Visibility and Ceiling

There is a probability that fog may occur in the area throughout the year. This probability is higher in nearshore areas owing to the temperature difference between land and water masses. During the period when sea ice covers the area, the percent frequency of fog is 10 percent nearshore decreasing to less than 5 percent offshore. However, during open-water periods, this percent frequency rises. For instance, in the period of June through September the percent frequency may be as high as 30 offshore and 20 nearshore (Brower et al., 1988). Tables 10-11 through 10-14 provide a summary of visibility and ceiling data for the prospect areas during the months of June through September.

Exploration Plan

OCS Lease Sale Area 109

Chukchi Sea, Alaska

Remote Offshore Prospects

Shell Western E&P Inc.

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December 1988

of the time (Wise, et al., 1981). Sustained winds of 50 to 56 knots, with higher gusts, have been recorded (Wilson, et al., 1982).

Offshore winds are also reported by the U.S. Naval Weather Service and are summarized on Tables 10-7 through 10-10 for the months of June through September. During the early summer (June and July) winds typically are out of either a general northerly or southerly direction. During August and September, they are more commonly out of the northeast. Mean speed are typically in the range of 10 to 15 knots.

10.4 Storm Occurrences

In the Chukchi Sea lease area, storm events are possible throughout the entire open water period from mid-June through November. October is the month of the most frequent storms in the Chukchi Sea. Storm movement is generally parallel to the Chukchi Sea coastline moving from the Bering Sea towards the Beaufort Sea.

Thirteen storm surges have been documented (Brower, et al., 1977) between 1960 and 1977 for the Chukchi and Beaufort Seas. The most severe recorded storm in the vicinity of Barrow produced westerly winds with sustained speeds of 42 knots and gusts to 64 knots, waves to 10 feet high, and a storm surge of 10 feet.

10.5 Visibility and Ceiling

Fog may be present in the Sale 109 area at anytime throughout the year (Brower, et al., 1977). During the period when sea ice covers the Chukchi Sea, fog occurs about 10 percent of the time. However, during open-water periods, fog becomes more common. In May through September, fog may occur between 20 and 30 percent of the time. Tables 10-11 through 10-14 provide a summary of visibility and ceiling data for the offshore areas during the months of June through September.

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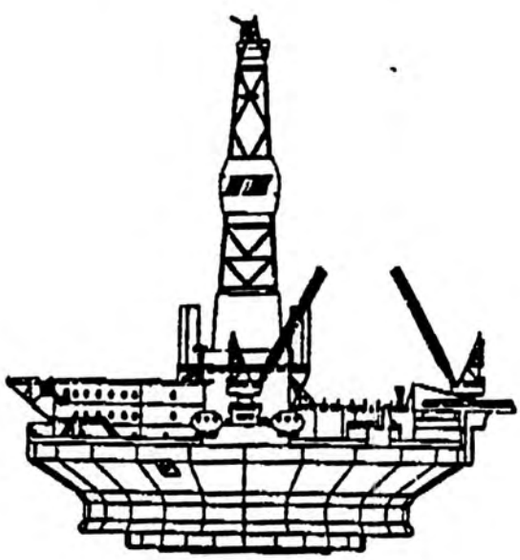
EXPLORATION PLAN
WEST MAKTAR PROSPECT
Beaufort Sea, Alaska



HLA

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JULY 1990

CHEVRON

Table 10-1. Mean and Extreme Air Temperature Summary for Barter Island, Alaska (°F)

Month	Mean Temperature	Mean Maximum Temperature	Mean Minimum Temperature	Highest Recorded Temperature	Lowest Recorded Temperature
January	-14.3	-7.8	-20.8	39.0	-54.0
February	-20.3	-14.1	-26.5	37.0	-59.0
March	-15.4	-8.6	-22.3	36.0	-51.0
April	-0.8	7.2	-8.8	43.0	-38.0
May	20.8	26.0	15.4	52.0	-16.0
June	34.2	38.1	30.2	68.0	13.0
July	39.9	45.1	34.7	78.0	24.0
August	39.1	43.7	34.3	72.0	24.0
September	31.5	35.1	27.8	64.0	4.0
October	15.3	20.3	10.2	46.0	-26.0
November	-0.1	5.7	-6.1	37.0	-51.0
December	-12.1	-6.5	-18.9	37.0	-51.0
ANNUAL	9.8	15.4	4.1	78.0	-59.0

Source: AEIDC, 1986.

10.3 Sky Cover and Visibility

Cloudy weather is prevalent along the Beaufort Sea coast. For over half of each year, the West Maktar Prospect area has low clouds with more than 50 percent coverage. Low clouds are defined as having bases less than 8,000 feet (2,600 meters) (AEIDC/NCC, 1988). Low clouds with more than 50 percent coverage occur most frequently in the summer. During August, September, and October, 50 percent and greater cloud coverage averages 23 days per month. Mostly clear skies are defined as total cloud coverage of 25 percent or less (AEIDC/NCC, 1988). Mostly clear skies occur an average of only 5 days per month during the same period (AEIDC/NCC, 1988).

Sky cover and visibility can be closely related. Low visibility can be caused by low clouds as well as dense fog, heavy precipitation, dust, and smoke. In general, visibility is good for most of the year near West Maktar Prospect. In Marine Area B, aircraft are restricted to Instrument Flight

Rules (IFR) flying an average of 45 days per year. Low visibility conditions can restrict even IFR aircraft operations. The frequency of low visibility conditions near West Maktar Prospect is presented in Table 10-2. The occurrence of "poor" and "optimum" visibility conditions is also presented in Table 10-2.

As shown by Table 10-2, periods of low visibility do not occur often, but are most frequent during August and September. Offshore operations are most likely to be affected by low visibility during these months. Poor visibility, which may restrict offshore operations, occurs much more frequently and uniformly throughout the year. Poor visibility is most frequent in July and August. In general, optimum conditions occur most frequently in the winter.

Darkness, while usually not a problem itself, aggravates the visibility restrictions caused by other conditions. The sun does not crown the horizon in the Beaufort Sea from mid-November to mid-February. A few hours of twilight are experienced from November to December and from mid-January to mid-February. Total darkness is experienced throughout December and part of January (ARCO Alaska, Inc., 1985).

Table 10-2. Frequency of Visibility Conditions Near West Maktar Prospect

Month	Low Visibility Conditions (days)	Poor[a] Visibility Conditions (days)	Optimum[b] Visibility Conditions (days)
January	3	10	6
February	2	10	4
March	<2	10	6
April	<2	11	5
May	<2	11	3
June	2	10	4
July	2	12	5
August	3	12	3
September	3	11	2
October	<2	9	3
November	2	9	5
December	2	11	5
TOTALS	19+	126	51

[a] Any one of the following constitutes poor conditions: Low cloud ceiling (LCC) <300 feet or visibility <1 nautical mile.

[b] Optimum conditions: LCC ≥ 5000 feet (or no LCC), visibility ≥ 5 nautical miles, and wind 11-21 knots.

Source: AEIDC/NCC, 1988