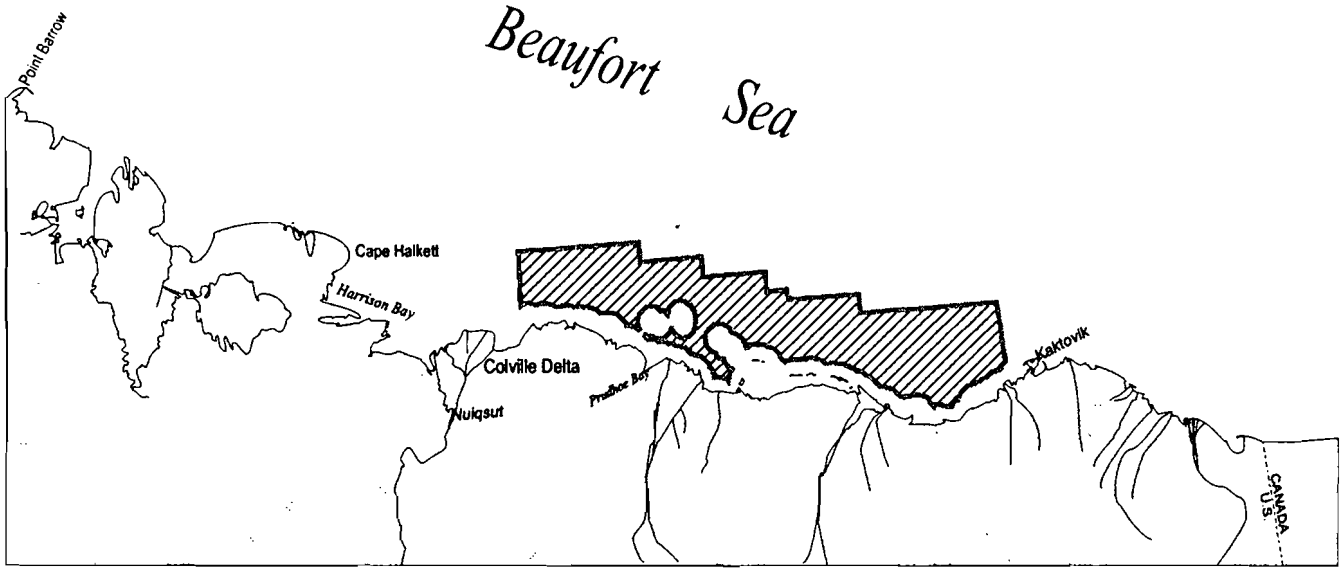
Alaska Outer Continental Shelf

OCS EIS/EA
MMS 98-0007

Beaufort Sea Planning Area Oil and Gas Lease Sale 170

Final Environmental
Impact Statement



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

This Environmental Impact Statement (EIS) is not intended, nor should it be used, as a local planning document by potentially affected communities. The exploration, development and production, and transportation scenarios described in this EIS represent best-estimate assumptions that serve as a basis for identifying characteristic activities and any resulting environmental effects. Several years will elapse before enough is known about potential local details of development to permit estimates suitable for local planning. These assumptions do not represent a Minerals Management Service recommendation, preference, or endorsement of any facility, site, or development plan. Local control of events may be exercised through planning, zoning, land ownership, and applicable State and local laws and regulations.

With reference to the extent of the Federal Government's jurisdiction of the offshore regions, the United States has not yet resolved some of its offshore boundaries with neighboring jurisdictions. For the purposes of the EIS, certain assumptions were made about the extent of areas believed subject to United States' jurisdiction. The offshore-boundary lines shown in the figures and graphics of this EIS are for purposes of illustration only; they do not necessarily reflect the position or views of the United States with respect to the location of international boundaries, convention lines, or the offshore boundaries between the United States and coastal states concerned. The United States expressly reserves its rights, and those of its nationals, in all areas in which the offshore-boundary dispute has not been resolved; and these illustrative lines are used without prejudice to such rights.

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U.S. Environmental Protection Agency
Region 10

Published by

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

February 1998

COVER SHEET

Environmental Impact Statement for Proposed Beaufort Sea OCS Lease Sale 170 (1998)

Draft ( ) Final (X)

Type of Action:

Administrative (x) Legislative ( )

Area of Proposed Effect:

Offshore marine environment, Beaufort Sea coastal plain, and the North Slope Borough of Alaska

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Island special mitigation), Alternative V.a (deferral of the area offshore the ANWR), and the mitigation (stipulations and information to lessees clauses) as applied to Alternative I.

Mitigating Measures: Five lease stipulations are included as part of proposed lease sale 170: Protection of Biological Resources, an Orientation Program, Transportation of Hydrocarbons, Industry Site-Specific Bowhead Whale-Monitoring Program, and Conflict Avoidance Mechanisms to Protect Subsistence Whaling and Other Subsistence Activities. Actual application of each of these stipulations to leases resulting from the proposed sale is an option available to the Secretary of the Interior. The MMS has included these stipulations in previous Beaufort Sea lease sales.

Four additional mitigating measures, termed special mitigating measures, are analyzed in conjunction with Alternatives IV and V. One special mitigating measure, Permanent Facility Siting in the Vicinity of Cross Island, applies only to Alternative IV and is analyzed as option IV.b of Alternative IV. The other measures—Planning for Activities Offshore the Arctic National Wildlife Refuge, OCS Pipelines Offshore the Arctic National Wildlife Refuge, and Protection of Polar Bears from Proposed Development Offshore the Arctic National Wildlife Refuge (ANWR)—apply only to Alternative V and are analyzed as option V.b of Alternative V.

Action Scenarios Analyzed: The MMS's analyses of environmental and sociocultural resources that may be affected by OCS activities are based on oil and gas resources MMS estimated and assumed will be leased and developed from the proposed lease sale. The size of the assumed oil and gas resources is based on many factors such as geologic structure, economic assumptions, and proximity to existing development. For Alternative I, the scenario analyzed is based on developmental activity associated with a reasonable range of resources (350-670 MMbbl of oil). An exploration-only scenario also is considered, which assumes that no economically recoverable quantities of crude oil are located.

The environmental analyses are based on these levels of assumed development and activities are correlated with the amount of resources estimated to be leased. These activities include the number of platforms, wells, pipelines, service-vessel trips, oil spills, etc. The MMS analyzes interactions of all OCS activities expected to result from the lease sale with environmental resources. A key component of this document is the analyses of effects associated with hypothetical oil spills that could be associated with Alternatives I, III, IV, and V and the cumulative case. The Oil-Spill-Risk Analysis estimates the chance of one or more spills ≥1,000 bbl occurring for the range of resources for Alternative I to be 46 to 70 percent. For Alternative III, the chance of one or more spills ≥1,000 bbl occurring ranges from 35 to 57 percent. For Alternative IV, the chance of one or more spills ≥1,000 bbl occurring ranges from 39 to 62 percent. For Alternative V, the chance of one or more spills ≥1,000 bbl occurring ranges from 31 to 55 percent. For the cumulative case, the most likely number of spills (≥1,000-bbl) is estimated to range from 5 to 11, of which Alternative I contributes 1 spill.

The cumulative analysis considers environmental effects expected to result from the incremental effects of the lease sale when added to the effects associated with the infrastructure and potential resources of existing fields. Accordingly, Alternative I is largely analyzed only in its relation to existing and producing fields. The cumulative case does not speculate on development from a variety of potential off- and onshore fields. Whether these fields reach production is a matter of some conjecture.

Significant Issues: Primary issues of concern identified through scoping include general effects on the marine and coastal environment, potential effects on subsistence resources, and impacts to cultural and social values. Specific resources and activities determined through the scoping process to warrant an environmental analysis included the following: water and air quality; lower trophic-level organisms; fishes; marine and coastal birds; pinnipeds, polar bears, and belukha whales; endangered and threatened species; caribou; economy of the North Slope Borough; sociocultural systems; subsistence-harvest patterns; archaeological resources; and land use plans and coastal management programs.

Part of the scoping process was the public review of the Draft EIS for Sale 170. In addition to those issues raised during the initial scoping meetings, public concerns voiced during the hearings on the Draft EIS included: cumulative effects to the ANWR coastal plain; community impact assistance, inability to clean up oil spills in arctic conditions and a lack of demonstrated ability, on the part of industry, to safely construct subsea pipelines in arctic conditions; lack of a deferral that included Cross Island; and lack of a deferral that included all Federal submerged lands off the ANWR. For other concerns raised during the Draft EIS hearings, please see Section V.B.1.

The scoping process is an ongoing effort whereby contacts are made with other Federal and State agencies, the public, academia, and environmental groups to identify those resources about which there is concern. Through this process, the significant resources and activities analyzed in the EIS are determined.

Impact Conclusions: Section II.G provides a comparison of the impacts of the resource estimate of the proposed Sale 170, the deferral alternative, and the cumulative analyses.

The summaries presented are based on the comprehensive analyses in Sections IV.B, IV.D, IV.E, IV.F and IV.G. A general summary of impacts resulting from Alternative I is as follows:

Summary of Effects on Abiotic Resources: Over the anticipated more than 22-year life of the field, concentrations of contaminants may exceed water-quality criteria for sublethal levels, over a few square kilometers, but should not achieve acute (toxic) levels. An oil spill ≥1,000 bbl temporarily and locally could increase water-column hydrocarbon concentrations over a few hundred square kilometers. The large number of very small spills anticipated over the life of the field could result in local, chronic contamination within the margins of the oilfield. Regional water quality would not be affected. Regarding air quality, exploration and developmental activities would not be sufficient to increase the concentrations of the criterial pollutants to the point they would exceed the air-quality standards.

Summary of Effects on Biological Resources: Overall, the activities associated with the resource estimate of Alternative I are expected to affect a very small portion of some of the populations of biological resources in the sale area. Oil spillage is expected to have lethal and sublethal effects on <5 percent of the lower trophic-level organisms, which include the phytoplankton, zooplankton, benthic, and epontic communities. Recovery is expected within a month but could take up to a year where water circulation is significantly reduced. Fishes exposed to discharges of drilling muds and cuttings, aircraft, vessel and drilling activities over the life of the field most likely would experience temporary, nonlethal effects. Some fishes are likely to suffer nonlethal effects from an oil spill. However, some fish species could incur significant losses should a spill occur in critical overwintering habitats and in summer feeding areas. The recovery of these populations could take a minimum lifespan time period. Effects to marine and coastal birds from oil spills are expected to result in the loss of several thousand birds due to oil contamination; however, the overall effects of displacement and mortality are expected to be minor at the population level. Small numbers of pinnipeds, polar bears, and belukha whales may be affected, with recovery within one generation (or 3-5 years). Bowhead whales exposed to noise-producing activities and oil spills could experience temporary nonlethal effects; however, some mortality might result if exposure to freshly spilled oil were prolonged, with the population recovering within 1 to 3 years. The overall effect on peregrine falcons from oil spills and disturbance is expected to be minimal; no mortality is expected to result from the proposed action. Effects to spectacled and Steller's eiders are expected to be minimal, affecting <2 percent of the population; however, recovery from any substantial mortality resulting from an oil spill is not expected to occur while the current uncertain population status persists. Effects to caribou are expected to include displacement within 4 km (2.48 mi) along the pipeline and roads for more than one generation and perhaps over the life of Alternative I, but these disturbances are not expected to affect caribou migration and overall distribution.

Summary of Effects on Sociocultural Resources: Effects on the sociocultural systems of communities (Barrow, Nuiqsut, and Kaktovik) in the sale area could occur as a result of assumed industrial activities, effects on subsistence patterns, and expected changes in population and employment. These effect agents could affect the social organizations, cultural values, and social health of the communities. Chronic disruptions to sociocultural systems are expected to occur for a period up to 1 year, but these disruptions are not expected to cause permanent displacement of ongoing community activities and traditional practices for harvesting, sharing, and processing subsistence resources.

The effects on subsistence-harvest patterns as a result of discharges, disturbance effects from seismic activity, aircraft noise, supply-vessel traffic, drilling noise, off- and onshore construction, oil spills, and oil-spill-cleanup activities likely would render one or more important subsistence resources unavailable, undesirable for use, available in reduced numbers, or their pursuit more difficult (with hunters having to travel farther than normal to harvest them) for up to an entire season (1 year). Regarding environmental justice, Alaskan Inupiat Natives, a recognized minority population, are the predominant residents of the NSB, the area potentially most affected by Alternative I. Inupiat Natives may be disproportionately affected because of their reliance on subsistence foods, and the proposed lease sale may affect subsistence resources and harvest practices. Mitigation developed for the proposed sale would prevent interference with the bowhead whale migration by preventing disturbance, would prevent conflicts to the bowhead whale hunt by assuring hunter access, and would mitigate against disturbance and contamination to onshore habitats and other subsistence resources such as caribou and polar bear. These effects to subsistence resources and subsistence harvests are expected to be mitigated substantially though not eliminated. No significant impacts are expected from the proposed action, but some less-than-significant impacts could occur to subsistence resources and subsistence and sociocultural activities.

Regarding the economy of the NSB, both resident and nonresident employment would be expected to increase, with one percent of all direct employment going to NSB residents. Nonresident direct employment would reside in existing industrial enclaves. Property-tax revenues would increase above the declining existing-condition levels at about 1 to 2 percent through the 22-year life of the field.

Other Resources: There should be no effects on submerged prehistoric sites as a result of the lease sale. The effect on shipwrecks should be low because of the requirement to review geophysical data prior to any lease activity. Oil-spill effects on onshore archaeological resources are expected to be <3 percent. Conflicts are possible with the North Slope Borough Coastal Management Plan concerning effects on subsistence resources, if spilled oil contacted the subsistence-hunting areas of Kaktovik and Nuiqsut.

Comparison of the Alternatives: A comparison of Alternatives I, III, IV.a and V.a for lower trophic-level organisms, fishes, peregrine falcon, eiders, bowhead whale, marine mammals, archaeology, air quality, and coastal zone management, shows that effects levels for all four alternatives are expected to be the same or similar. In reviewing Alternatives I, III, IV.a, and V.a, caribou, sociocultural, subsistence, water quality and economics may be affected by the various block-deletion alternatives. For caribou, Alternatives III and V.a would achieve the greatest level of effects reduction, especially for the Porcupine Caribou Herd. Overall effects for the Central Arctic Herd for all alternatives would remain the same as Alternative I. For subsistence and sociocultural resources, the effects of Alternatives III and V.a would feature a slight reduction in effects for Kaktovik, with Alternative V offering slightly more protection to Nuiqsut. Alternative IV.a would slightly reduce effects to Nuiqsut but have no effect on Kaktovik. For all alternatives, effects on Barrow would remain the same as Alternative I. Regarding water quality, Alternatives III and IV.a would achieve similar reductions in permitted discharges and areas affected by turbidity (25-33%) from those of Alternative I; however, block deferrals for Alternative V.a would see the greatest reductions in both discharges and turbidity (as much as 50%). For economics, Alternatives III and IV.a would result in a 10- to 20-percent decrease in property tax revenues, direct oil-related employment, and related residential employment. Alternative V.a would result in a 40-percent decrease in property revenue and related oil-industry employment.

Regarding Alternatives IV.b and V.b, in which special mitigating were employed in lieu of deferral; these special mitigating measures are expected to have no effect at all for lower trophic-level organisms, archaeology, and air quality. For marine and coastal birds, Alternative IV.b would be similar in levels of effects to Alternative I; however, within the deferral area of Alternative V.b, the effects of oil and gas development would be reduced to negligible levels. Overall, special mitigating measures for Alternative V.b would provide the same level of protection for marine and coastal birds as block deferrals. Regarding caribou, special mitigating measures for Alternative IV.b would achieve no changes from Alternative I effects levels; for Alternative V.b, special mitigating measures would achieve the same level of effects for caribou as actual block deferrals. Regarding water quality, special mitigating measures for Alternatives IV.b and V.b would not change substantively the level of effects portrayed in those areas for Alternative I. Regarding, eiders, subsistence, sociocultural issues, bowhead whales, fishes, peregrine falcon, marine mammals, economics, and coastal zone management, special mitigating measures for Alternatives IV.b and V.b would achieve the same level of effects as actual block deferrals.

On balance, the adoption of Alternative IV.a would result in only marginal reductions of effects from Alternative I in most resource categories. Alternatives III and V.a would achieve the greatest reductions in effects from Alternative I. Of the two, Alternative V.a would result in the greater reduction in effects, especially regarding effects on the ANWR and its coastal plain. Regarding special mitigating measures for Alternatives IV.b and V.b, in most resource categories they are expected to achieve the same level of effects as actual block deferrals.

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LIST OF ACRONYMS AND SYMBOLS

AAC	Alaska Administrative Code
AADT	Annual Average Daily Vehicle Traffic
ACI	Alaska Consultants, Inc.
ACMA	Alaska Coastal Management Act
ACMP	Alaska Coastal Management Program
ADEC	Alaska Department of Environmental Conservation (State)
ADF&G	(State of) Alaska Dept. of Fish and Game
ADOL	(State of) Alaska Dept. of Labor
AEWC	Alaska Eskimo Whaling Commission
AHRS	Alaska Heritage Resources Survey
AMSA	area meriting special attention
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
ANWR	Arctic National Wildlife Refuge
AOAC	Alaska OCS Advisory Committee
AOGA	Alaska Oil and Gas Association
AOGCC	Alaska Oil and Gas Conservation Commission
ARBO	Arctic Region Biological Opinion
ARRT	Alaska Regional Response Team
Area ID	Area Identification
AS	Alaska Statutes
ASNA	Arctic Slope Native Association
ASRC	Arctic Slope Regional Corporation
B.P.	Before Present
Bbbl	billion barrels
bbl	barrel(s)
bcfd	billion cubic feet per day
BF	Beaufort Sea (Sale BF)
BLS	Bureau of Labor Statistics
BP	British Petroleum
BPX	BP-Alaska Exploration
BTF	Biological Task Force
BWASP	Bowhead Whale Aerial Survey Project
ca.	about
CAH	Central Arctic (Caribou) Herd
Call	Call for Information and Nominations
CCP	Comprehensive Conservation Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CI	Confidence Intervals
CIP	Capital Improvement Program
CISPRI	Cook Inlet Spill Prevention and Response, Inc.
cm	centimeters
CMP	Coastal Management Program
CO	carbon monoxide
COE	(U.S. Army) Corps of Engineers
CPC	Coastal Policy Council
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibel(s)
dB re 1μ Pa	decibels relative to 1 microPascal
DEIS	Draft EIS
DNR	(State of Alaska) Dept. of Natural Resources
DPP	Development and Production Plan
EIS	Environmental Impact Statement
E.O.	Executive Order
ERA	Environmental Resource Area
ESA	Endangered Species Act
ESI	Environmental Sensitivity Index
ESP	Environmental Studies Program
ESSP	Environmental Studies Strategic Plan
EVOS	*Exxon Valdez* Oil Spill
FEIS	Final EIS
FOSC	Federal On-Scene Coordinator
FR	*Federal Register*
ft	feet/foot
ft/yr	feet per year
ft^2	square foot/feet
FWS	Fish and Wildlife Service
FY	Fiscal Year
g	gram/s
g/l	grams per liter
G&G	geological and geophysical (activity)
$gC/yr/m^2$	grams of carbon per year per square meter
GMU	Game Management Unit
ha	hectare(s)
Hz	hertz
IAP	Integrated Activity Plan
I/SS	Ice/Sea Segment/s
IHA	Incidental Harassment Authorization
in	inch/inches
in^3	cubic inch/inches
IRA	Indian Reorganization Act
ISER	Institute for Social and Economic Research
ISS	International Sea State
ITL	Information to Lessees
IWC	International Whaling Commission
JPO	Joint Pipeline Office
kg	kilogram(s)
KIC	Kaktovik Inupiat Corporation
km	kilometer(s)
km^2	square kilometers
km^3	cubic kilometers
kn	knot/s
lb	pound(s)
LC_{50}	concentration at which half the test organisms die within 3 days
LMR	Land Management Regulations
LNG	liquefied natural gas
LOA	Letter of Authorization
LS	Land Segment
LWCF	Land and Water Conservation Fund
m	meter(s)
m/sec	meters per second
m/yr	meters per year
mg/l	milligrams per liter
mi	mile(s)
mi^2	square mile(s)

mi^3	cubic mile(s)
ml	milliliter(s)
MMbbl	million barrels
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
MOU	Memorandum of Understanding
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NLSS	northern lead system (during) spring
NMFS	National Marine Fisheries Service
nmi	nautical mile/s
nmi^2	square nautical mile(s)
No_2	nitrous oxides
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent to Prepare an EIS
No_x	nitrogen oxide
NPDES	National Pollution Discharge Elimination System
NPR-A	National Petroleum Reserve-Alaska
NPS	National Park Service
NRC	National Research Council
NSB	North Slope Borough
NSBMC	North Slope Borough Municipal Code
NTL	Notice to Lessee
OCD	Offshore and Coastal Dispersion (model)
OCRM	Office of Ocean and Coastal Resource Management
OCS	Outer Continental Shelf
OCSLA	OCS Lands Act
ODCE	Ocean Discharge Criteria Evaluation
OPA '90	Oil Pollution Act of 1990
OSCP	Oil-Spill Contingency Plan
OSRA	Oil-Spill-Risk Analysis
P.L.	Public Law
PAH	polynuclear aromatic hydrocarbons
PCH	Porcupine Caribou Herd
PM	particulate matter
ppb	parts per billion
ppm	parts per million
PSD	Prevention of Significant Deterioration (Program)
RAM	Rural Alaska Model
RS/FO	Regional Supervisor/Field Operations
SIS	Social Indicators Study
SLS	Spring Lead System
S:N	signal-to-noise ratio
SO_2	sulfur dioxide
SPM	suspended particulate matter
SRA	Subsistence Resource Area
TAGS	Trans-Alaska Gas System
TAH	total aromatic hydrocarbons
TAPS	Trans-Alaska Pipeline System
Tcf	trillion cubic feet
TLH	Teshekpuk Lake (Caribou) Herd
U.S.C.	United States Code
UAA	University of Alaska, Anchorage
U.S.C.	United States Code
USCG	U.S. Coast Guard
USDOC	U.S. Dept. of Commerce
USDOD	U.S. Dept. of Defense
USDOE	U.S. Dept. of Energy
USDOI	U.S. Dept. Of the Interior
USDOL	U.S. Dept. of Labor
USDOT	U.S. Dept. of Transportation
USEPA	U.S. Environmental Protection Agency
UTP	Union-Texas Petroleum
VOC	volatile organic compounds
yd	yard(s)
yd^3	cubic yard(s)
°	degree symbol
°C	degrees Celsius (centigrade)
$\mu g/g$	micrograms per gram
$\mu g/l$	micrograms per liter
$\mu g/m^3$	micrograms per cubic meter
<	less than
>	greater than
≤	less than or equal to
≥	equal to or greater than
%	percent
$^0/_{00}$	salinity symbol

SECTION I

PURPOSE AND BACKGROUND OF THE PROPOSED ACTION

Section I Purpose and Background of the Proposed Action

I. PURPOSE AND BACKGROUND OF THE PROPOSED ACTION

A. PURPOSE, NEED, AND DESCRIPTION: The purpose of the proposed Federal action addressed in this Environmental Impact Statement (EIS) is to offer for lease an area on the Beaufort Sea Outer Continental Shelf (OCS) that may contain economically recoverable oil and gas resources. The proposed action will provide qualified bidders the opportunity to bid upon certain blocks in the Beaufort Sea to explore, develop, and produce oil and natural gas. This EIS analyzes the potential impacts of the proposed action, including exploration, development, and production on the marine, coastal, and human environments.

The OCS Lands Act (OCSLA) of 1953 (67 Stat.462), as amended (43 U.S.C. et seq. (1994)), established Federal jurisdiction over submerged lands on the OCS seaward of the State boundaries. Under the OCSLA, the U.S. Department of the Interior (USDOI) is required to manage the leasing, exploration, development, and production of oil and gas resources on the Federal OCS. The Secretary of the Interior (Secretary) oversees the OCS oil and gas program and is required to balance orderly resource development with protection of the human, marine, and coastal environments while simultaneously ensuring that the public receives an equitable return for these resources and that free-market competition is maintained. The act empowers the Secretary to grant leases to the highest qualified responsible bidder(s) on the basis of sealed competitive bids and to formulate such regulations as necessary to carry out the provisions of the act. The Secretary has designated the Minerals Management Service (MMS) as the administrative agency responsible for the mineral leasing of submerged OCS lands and for the supervision of offshore operations after lease issuance.

Six oil and gas lease sales have been held in the Beaufort Sea, beginning in 1979. In the Beaufort Sea Planning Area, 30 exploratory wells have been drilled and 10 leases have been determined producible. Except for the Northstar and Liberty prospects, none of these leases has been determined economically producible under current economic and market conditions. The Northstar and Liberty prospects are being pursued by industry for potential development options.

On September 30, 1996, the Call for Information and Nominations (Call) for proposed Sale 170 was published in the *Federal Register* (61 *FR* 51123). The 30-day comment period closed on October 30, 1996. The Call provides an opportunity for the oil industry, governmental organizations, tribal and local governments, environmental groups, and the general public to comment on areas of interest or special concern in the proposed lease-sale area. In response to the Call, 11 comments and/or nominations were received: five companies commented and submitted nomination information. Comments were received from the State of Alaska; the USDOI, Fish and Wildlife Service (FWS); the North Slope Borough (NSB); the Alaska Eskimo Whaling Commission (AEWC); the City of Nuiqsut; and the Native Village of Barrow Inupiat Traditional Government. The nominations received indicated interest in the entire area. The comments received on the Notice of Intent to Prepare an EIS (NOI) are discussed in Section I.C, Results of the Scoping Process.

In accordance with the Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA), an NOI for Sale 170 was published in the *Federal Register* on November 8, 1996 (61 *FR* 57892). Publication of the NOI serves to announce the intent to prepare an EIS and describes the scoping process followed for the EIS. The CEQ defines scoping as "an early and open process for determining the scope of issues to be addressed in an EIS and for identifying the significant issues related to a proposed action" (40 CFR 1501.7). The NOI formally initiated the scoping process for the lease sale. Scoping is a means for early identification of important issues for study in the EIS. Comments are invited from any interested persons, including affected Federal, State, tribal, and local governments; any affected Native groups; conservation groups; and private industry. Scoping provides those with an interest in the OCS program an early opportunity to participate in the events leading to publication of the Draft EIS (DEIS). It is a means for early identification of important issues deserving of study in the EIS. The intent of scoping is to avoid overlooking important issues that should be analyzed in the EIS. Further information on the scoping process is found in Section I.C.

Information obtained from the Call is considered part of scoping. Based on information gained through the scoping process—which includes staff evaluation and input—major issues, alternatives to the proposed action, and measures that could mitigate the effects of the proposed action are identified for analysis in the EIS. For proposed Beaufort Sea Sale 170, the MMS held scoping meetings in Nuiqsut on November 7, 1996; Barrow on November 8, 1996; and Kaktovik on November 12, 1996. A scoping meeting was held in Anchorage on November 26, 1996. At the request of the Mayor of Nuiqsut, an additional scoping meeting was held on January 10, 1996, in Anchorage.

Area Identification (Area ID) determines whether to proceed with, delay, or cancel the further development and analysis of a leasing proposal. The Regional Director, MMS, uses a decision document to make a recommendation to headquarters as to whether, when, and how to proceed with Area ID. The Area ID formally identifies the location and extent of the proposed lease-sale

villages and municipalities to compensate for loss or damage to subsistence resources and other spill-related expenses. Claims for damage or loss by users of subsistence resources may not be paid from these grants. Individuals must submit their claims to the party responsible for the loss or damage. The discussion here addresses loss or damages as a result of discharges (or substantial threats of discharges) under OPA '90 and the State's oil-and-hazardous-substance-release response fund.

In January 1996, the National Oceanic and Atmospheric Administration (NOAA) implemented regulations (15 CFR Part 990, 61 *FR* 440 01/05/96) for assessment of natural-resources damages resulting from a discharge or substantial threat of a discharge of oil. It provides a natural-resource damage-assessment process for developing a plan for restoration of the injured natural resources and services and pursuing implementation or funding of the plan by responsible parties. It also provides an administrative process for involving interested parties in the assessment, a range of assessment procedures for identifying and evaluating injuries to natural resources and services, and a means for selecting restoration actions from reasonable range of alternatives.

The MMS Alaska OCS Region Reference Paper No. 83-1, *Federal and State Coastal Management Programs* (McCrea, 1983), incorporated herein by reference, describes the coastal management legislation and programs of the Federal Government and the State of Alaska. This paper highlights sections particularly pertinent to offshore oil and gas development and briefly describes some of the effects of the Alaska Native Claims Settlement Act and the Alaska National Interest Lands Conservation Act on coastal management.

Pursuant to the 1984 Memorandum of Understanding between the USEPA and the USDOI concerning the coordination of National Pollution Discharge Elimination System (NPDES) permit issuance with the OCS oil and gas lease program, the MMS Alaska OCS Region and the USEPA Region 10 entered into a Cooperating Agency Agreement to prepare EIS's for oil and gas exploration and development and production activities on the Alaskan OCS. Section 402 of the CWA authorizes the USEPA to issue NPDES permits to regulate discharges to waters of the United States, including the territorial seas, contiguous zone, and oceans. The NPDES permits for OCS oil and gas facilities many contain effluent limitations developed pursuant to sections of the CWA, including sections 301, 302, 306, 307, and 403. With the offshore subcategory under the CWA, the USEPA may have NEPA responsibilities for permits issued to new sources (Sec. 306 of the CWA), which overlap with those of MMS. The USEPA's primary role in the Cooperating Agency Agreement is to provide expertise in those fields specifically under its mandate.

In conjunction with the issuance of an NPDES permit, the USEPA is responsible for publishing an Ocean Discharge Criteria Evaluation (ODCE) that evaluates the impacts of waste discharges proposed for oil and gas projects. The purpose of the ODCE is to demonstrate whether or not a particular discharge will cause unreasonable degradation to the marine environment. A copy of the ODCE for this project may be obtained by calling 1-800-424-4EPA and asking for the NPDES Permits Unit.

After leases are awarded, the MMS's Field Operations Office is responsible for approving, supervising, and regulating operations conducted on the lease. Prior to exploration activities on a lease, except certain preliminary activities, a lessee must submit to MMS for approval an exploration plan, an Oil-Spill-Contingency Plan, and an Application for Permit to Drill. The Office of Ocean and Coastal Resource Management, FWS, NMFS, USEPA, National Park Service (NPS), U.S. Army Corps of Engineers (COE), U.S. Coast Guard, the State of Alaska, and the public are provided an opportunity to comment on the exploration plan. The exploration plan must be approved or disapproved within 30 days, subject to the State of Alaska's concurrence or presumed concurrence with the lessee's coastal zone consistency certification (pursuant to the Federal Coastal Zone Management Act). The MMS's Environmental Studies Program is designed to monitor changes in human, marine, and coastal environments during and after oil exploration and development and is authorized in Section 20(b) of the OCSLA: "Subsequent to the leasing and development of any area or region, the Secretary shall conduct such additional studies to establish environmental information as he deems necessary and shall monitor the human, marine, and coastal environments of such area or region in a manner designed to provide time-series and data trend information which can be used for comparison with any previously collected data for the purpose of identifying any significant changes in the quality and productivity of such environments, for establishing trends in the areas studied and monitored, and for designing experiments to identify the causes of such changes."

C. RESULTS OF THE SCOPING PROCESS:

Scoping for this EIS included reviewing the comments received on the Call and NOI; comments submitted at the scoping meetings; reevaluation of the issues raised and analyzed in the EIS's for previous Beaufort Sea Planning Area lease sales (Sales BF, 71, 87, 97, 124, and 144); and MMS staff investigation. Scoping comments for the proposed lease sale were requested from the public through newspaper, radio, and television advertisements in the NSB communities of Barrow, Nuiqsut, and Kaktovik as well as in Anchorage. Letters were sent to the Mayor of the NSB as well as the Mayors of Barrow, Nuiqsut, and Kaktovik. The MMS also developed a *Beaufort Focus* pamphlet, published in both English and Inupiaq, which outlined the

planning process for proposed Sale 170. It identified the proposed Sale 170 area, possible alternatives to the area, and mitigation and specific issues and concerns identified to date that would be analyzed in the EIS. This pamphlet was mailed to the North Slope communities of Barrow, Nuiqsut, and Kaktovik, and Federal and State agencies, as part of the Sale 170 outreach and scoping process, and requested that written comments be provided on the *Beaufort Focus* by January 3, 1997. Two written comments on the *Beaufort Focus* pamphlet were received expressing appreciation for developing a bilingual informational product to reach potentially affected stakeholders.

Sale 170 scoping meetings were held in Nuiqsut, Barrow, Kaktovik, and Anchorage on November 7, 8, 12, and 26, 1996, respectively. A second scoping meeting, requested by the Mayor of Nuiqsut to further define a proposed Nuiqsut Deferral area, was held in Anchorage on January 10, 1997. Representatives of the City of Nuiqsut and the NSB attended. The MMS received six written comments as a result of the Call—the Office of the Governor, State of Alaska; the USDOI, FWS; the NSB; the AEWC; the City of Nuiqsut; and the Native Village of Barrow. The Office of the Governor declined to make specific comments. The NSB, the AEWC, the cities of Nuiqsut and Kaktovik, and the Native Village of Barrow oppose the proposed sale but indicated a willingness to work with MMS throughout the process. All commenters strongly supported the adoption of the Beaufort Sea Sale 144 mitigating measures in Sale 170. No written comments were submitted in response to the NOI.

Scoping, which is an ongoing process, will continue through the publication of the Final EIS, and additional outreach meetings will be held, as needed or requested by local communities. As part of the scoping process, an Arctic Seismic Synthesis and Mitigating Measures Workshop was held in Barrow, Alaska, in March 1997 to elicit observations from subsistence whaling captains on the effects of seismic activities on bowhead whales. This traditional knowledge will be combined and synthesized with research and monitoring data on the bowhead whale migration.

A second *Beaufort Focus* pamphlet was developed and distributed to Nuiqsut, Kaktovik, and Barrow at the time the Draft EIS was issued in May 1997. This pamphlet provided detailed information on the content and availability of the Draft EIS, and scheduled public hearing dates and locations. In addition to providing information on the alternatives presented in the EIS, the pamphlet included a concise overview and summary of how to read the EIS to enable the reader to focus comments on the document in preparation for the public hearings that were held in June and July 1997.

In response to comments on the Draft EIS, the MMS worked closely with the NSB to expand and update information for the Final EIS to include additional information on traditional knowledge of residents of the Arctic related to the bowhead whale and subsistence-harvest activities—through direct dialogue between authors and the NSB as well as a meeting in Barrow in September directly with the Borough to resolve outstanding issues. In addition, the AOAC suggested wording revisions to stipulations and ITL's to properly reflect that Stipulation 4 is really a conflict avoidance mechanism.

1. Major Issues Considered in the EIS: The major issues that frame the environmental analysis contained in this EIS are the direct result of concerns raised during the scoping process. These concerns, registered in the form of oral and written comments, were raised during the scoping period preceding the compilation of this document. From the concerns and comments raised during the scoping process, the resource topics selected for effects analyses in Section IV.B were chosen. The Section IV.B topics are Water Quality; Lower Trophic-Level Organisms; Fishes; Endangered and Threatened Species; Marine and Coastal Birds; Pinnipeds, Polar Bears, and Belukha Whales; Caribou; Economy of the North Slope Borough; Subsistence-Harvest Patterns; Sociocultural Systems; Archaeological Resources; Air Quality; and Land Use Plans and Coastal Management Programs.

The following describes significant issues identified through comments received during the scoping process.

a. Significant Environmental Issues: The following environmental issues were identified during Sale 170 scoping and are related to important resources, activities, systems, or programs that could be affected by petroleum exploration, development and production, and transportation activities associated with the proposed action. These issues reflect essentially the same types of concerns as were noted in the previous EIS in the Beaufort Sea (Sale 144).

(1) Concerns Regarding the Effects of Oil Spills:

(a) Contamination and Effects: The most significant concern noted during scoping was that if spilled oil occurred, it would contaminate the affected marine and coastal environments and, depending on the amount, have short- to long-term, local to regional effects on those environmental resources and sociocultural systems adjacent to the Beaufort Sea Planning Area. A spill event, especially a large one, could have a significant effect on water quality, whereas in situ burning of spilled oil would affect the air quality of the region. Also affected would be lower trophic-level organisms within the spill area. Marine mammals, including endangered and threatened species,

could be affected as they migrate through the Beaufort Sea. Contamination effects on marine mammals, particularly the endangered bowhead whale, raised specific concerns. The bowhead whale is integral to the continuation and survival of the cultural and subsistence lifestyle of the Inupiat and is an important subsistence-food staple. The bowhead whale population could be affected by spilled oil as bowheads migrate through the Beaufort Sea. Threatened species include the spectacled eider and Steller's eider. The Steller's eider has been recommended for listing as threatened but has not yet been formally approved for that designation.

Other resources crucial to Inupiat subsistence that could be affected by an oil spill include anadromous fishes, including the arctic cisco, and various marine and coastal birds. Contamination of lower trophic-level organisms and other migratory species such as polar bears, a species of special concern, and caribou within the spill area also might occur.

A spill adversely could place at risk many of the traditional Inupiat food sources and, thereby, could affect the economic well-being of the North Slope. The temporary or permanent elimination of primary subsistence foods would cause North Slope residents either to shift to less desired subsistence resources or have to replace subsistence foods with expensive western foods. A full discussion of the effects of Alternative I on the various resources discussed in this subparagraph is contained in Section IV.B.

(b) **Fate, Behavior, and Cleanup of Spilled Oil:** Of great concern to many parties was the fate and behavior of spilled oil in the marine and coastal environments and the strategies and methods of spill cleanup. During scoping, concerns were raised regarding: (1) the availability and adequacy of containment and cleanup technologies, especially under broken-ice conditions; (2) the ability to detect and clean up pipeline spills and spills under ice; (3) the effect of winds and currents on the transport of spilled oil within ice; (4) the removal of oil from contaminated water sediments and ice; (5) the toxicological properties of fresh and weathering oil; and (6) the air pollution that would result from the at-sea evaporation or burning of spilled oil.

(2) **Effect of Discharges Associated with Petroleum Operations:** Concerns were noted regarding routine discharges, including those of formation waters, associated with petroleum operations. It was feared that such discharges would affect water quality, lower trophic-level organisms, and fishes. Discharge of produced waters also may affect water quality and subsistence activities.

(3) **Habitat Disturbance and Alteration:** During the scoping process, it was noted that both offshore and onshore construction activities and activities associated with the operation of petroleum facilities likely would result in some habitat disturbance and alteration.

(a) **Habitat Disturbance:** Habitat disturbance, including noise, would be associated with air traffic, vessel operations, traffic along roads, marine and over-the-ice seismic activities, offshore drilling, dredging, vessels involved in icebreaking and management operations, and facility construction. Depending on the type of operation and the time of occurrence, it was observed, these habitat disturbances could have some short- to long-term local to regional effects on fishes (particularly anadromous species such as the arctic cisco), marine and coastal birds, marine mammals, caribou, and endangered and threatened species such as the bowhead whale and the spectacled eider, all of which will have an effect on subsistence hunting and fishing. The primary concern in all communities and by the NSB is interference with the bowhead whale hunt.

(b) **Habitat Alteration:** Habitat alteration, including reduction, would be associated with both onshore and offshore construction activities that include pipeline and road construction, dredging (excavation and dumping of dredged material), removal of gravel from onshore sites, and dumping of onshore gravel in offshore locations. During the scoping process, it was observed that depending on the type of operation and the time and location of occurrence, some effects may occur to lower trophic-level organisms, fishes (especially anadromous species), marine and coastal birds, marine mammals, endangered bowhead whales (especially in the fall-feeding area), caribou, archaeological resources, and subsistence-hunting and -fishing activities as they relate to reduced access to the resources and changes in practices.

(4) **Protection of Inupiat Culture and Way of Life:** Of particular concern was that the Inupiat culture and way of life may need to be protected from effects associated with petroleum-development activities. Concern was voiced that petroleum activities might lead to social disruption and a change in cultural values through population changes (emigration of large numbers of non-Inupiats to the North Slope), employment changes (further displacement of the subsistence lifestyle by a cash economy), effects of multiple industrial activities, and the alteration of subsistence-harvest patterns as discussed in relation to other significant issues previously noted in this section. Due to the nutritional and cultural importance of marine mammals, especially the bowhead whale, it should be recognized that there are no suitable replacements for these resources, and mitigating measures may never recover the true loss.

(5) **Other Significant Issues:** Following are other significant issues related to petroleum-development activities that were raised during the scoping process:

▸ Incorporation of traditional knowledge in the EIS was a concern expressed in the North Slope communities and in Anchorage throughout the scoping process. The Sale 144 FEIS (USDOI, MMS, 1996a) incorporated traditional knowledge received from NSB residents into its analysis of effects related to subsistence and the bowhead whale. The need to recognize and include traditional knowledge along with western science to provide first-hand knowledge by local whalers and other subsistence users must be expanded in this EIS.

▸ The scoping process raised concerns about the cumulative effects on the biological and physical resources and social systems in and adjacent to the planning area from present and future Arctic Region OCS oil and gas lease sales and other major projects, including the Northstar Development Unit in offshore State and Federal waters and the onshore Alpine project near Nuiqsut and existing causeways; see *b.* below.

▸ Concerns were expressed during scoping regarding potential permitting conflicts with local coastal management programs and consistency requirements and the effects of OCS lease sales. It was noted that OCS development-related activities may result in land use changes that may occur from the construction of onshore-support facilities, docking facilities, airfields, and multiple development activities. Also, petroleum-related activities may result in the establishment of pipeline rights of way and new transportation corridors.

▸ Concerns were expressed that mitigating measures from Beaufort Sea Sale 144 need to be included in the terms of this proposed Sale 170 mitigating measures package.

b. Cumulative Effects: The cumulative effects of present and future major activities on each of the resources, activities, systems, or programs that were identified as significant issues in this section are analyzed in this EIS (see Secs. IV.A.5 and IV.G).

Future major activities considered under the cumulative case and the oil-spill-risk analysis for Sale 170 are (1) petroleum-development and -production projects and transportation systems with estimated resources, (2) major construction projects with approved construction permits or other indications of coming to fruition, and (3) other major natural resource-related projects. Future activities that do not meet these criteria are mentioned and described if they affect the resources, systems, programs, or activities that have been identified as significant issues.

c. Issues Raised During Scoping that Were Considered but Did Not Warrant Detailed Analysis in the EIS: The following issues were raised during the scoping process for this sale and previous Beaufort Sea lease sales. These concerns were fully evaluated by the MMS staff but are not to be analyzed or separately considered for the reasons indicated.

(1) Increased Federal Revenue Sharing: An issue repeatedly identified as being of primary concern to the villages of Nuiqsut and Kaktovik and to the NSB is the need for revenue-sharing assistance to local communities from OCS receipts. Section 8(g) of the OCSLA currently provides for revenue sharing from leasing activities on a portion of the OCS to affected coastal states. Impact assistance beyond that provided for under the OCSLA would require congressional action. The likelihood of adopting additional impact assistance is uncertain and was not considered an issue warranting detailed analysis in this EIS. A more appropriate forum to address this concern is the AOAC established for Sale 170. Elevation of this concern is particularly important, given that the City of Nuiqsut identified this as more appropriate mitigation than a deferral alternative. During the public hearings in Nuiqsut and Kaktovik, the need for impact assistance from OCS activities to local communities clearly was a major concern.

At the August 5-6, 1997, AOAC meeting in Anchorage, the question of impact assistance was discussed. The MMS supports developing legislation for impact assistance to local communities. Concerns of local communities are being addressed to provide impact assistance for chronic impacts from oil development. A Coastal Impact Assistance Working Group, established under the OCS Policy Committee recently has developed recommendations for a coastal impact assistance program. Representatives of the coastal states of Louisiana, California, North Carolina, Oregon, Texas, and Alaska comprise this group. A report was prepared and submitted to the OCS Policy Committee. At their October 1997 meeting, the full committee acted on the resolution to adopt the recommendations of the working group and submit it to the Secretary of the Interior for consideration. The plan is designed to provide monies for the mitigation of coastal impacts, and would allow all coastal states, including the Great Lakes States, and affected local communities to share in offshore drilling revenues. The Secretary of the Interior will consider the OCS Policy Committee's recommendations, which will require a change in the OCSLA to implement any changes in revenue sharing among coastal states and local communities.

In addition, it appears that the Secretary of the Interior, under authorities granted in 42 U.S.C. 6507 of the National Petroleum Reserve Act, may provide Federal financial assistance for increased municipal services and facilities in communities located on or near the Reserve resulting from authorized exploration and study activities. It states that, "If the Secretary of the Interior determines that there is an immediate and substantial increase in the need for municipal services and facilities in communities located on

or near the reserve as a direct result of the exploration and study activities authorized by this chapter and that an unfair and excessive financial burden will be incurred by such communities as a result of the increased need for such services and facilities, the Secretary is then authorized to assist such communities in meeting the costs of providing increased municipal services and facilities. The Secretary of the Interior shall carry out the provisions of this section through existing Federal programs and he shall consult with the heads of the departments or agencies of the Federal Government concerned with the type of services and facilities for which financial assistance is being made available." (Title 42, U.S.C., Chapter 78 (NPRA),Section 6507). There may be some avenue to explore this provision to provide impact assistance to local communities from OCS exploration and development activities. The MMS will continue to explore this avenue of potential assistance.

Other potential sources of impact assistance to local communities may be derived from the Land and Water Conservation Fund (LWCF). The LWCF, authorized by Public Law 88-578, became effective January 1, 1965. The fund has two primary purposes: (1) to provide matching grants to the states for planning, acquisition, and development of outdoor facilities; and (2) to provide funds for Federal acquisition of land and interests in land. The LWCF Act currently authorizes the appropriation of $900 million per year for Federal acquisition and grants to states. The prime source of funds is the revenues received from the OCS oil and gas leasing royalty revenues. The LWCF funds are requested by each of the four Federal bureaus that use the fund: the NPS, FWS, the Bureau of Land Management, and the Forest Service. When appropriated by Congress, the funds are allocated to specific areas for land acquisition. The NPS has a line item for inholding, emergency, and hardship use that can be used only in authorized areas.

(2) Participation of Local Communities: The need for active participation and involvement of the NSB and local communities was raised at each of the scoping meetings and in written comments submitted on the Call. Borough, City, and Native village participation in the review of oil-industry operations and development of monitoring programs was cited, as well as the need for local participation and representation on the Sale 170 AOAC by the NSB; the villages of Nuiqsut, Kaktovik, and Barrow; and the AEWC. Committee membership has been resolved; therefore, this issue is moot and requires no detailed analysis in this EIS. This committee played an important role in the development of additional alternatives for consideration in the Final EIS and additonal protective mitigating measures for Sale 170. As part of the public review process required by NEPA, *all* comments received on the Draft EIS are analyzed and included in the Final EIS.

2. Alternatives:

a. Alternatives Suggested During the Scoping Process: Several alternatives were suggested during the Sale 170 area identification and scoping process. The following alternatives appear in two sets. Those comprising the first set are labeled Alternatives I (lease of the entire 363 block area), II (No Lease Sale), and III (Kaktovik Deferral Alternative). These alternatives were developed during the scoping process prior to the preparation of the Draft EIS as a response to comments and concerns. Additionally, two other alternatives (Cross Island Area, and the Area Offshore the ANWR) were added based on comments on the Draft EIS. These five alternatives form the alternatives upon which this EIS is based. The second set consists of the Nuiqsut Deferral Alternative, Barter Island Alternative; Canning River Alternative, Colville River Delta Alternative, and Bowhead Whale Feeding Area Alternative. These alternatives were suggested during the scoping process and were considered but rejected, as explained later in this section.

(1) Description of Alternative I: Alternative I would offer for lease those parts of the Beaufort Sea Planning Area that were selected as a result of Area ID. It would offer for lease 363 blocks, covering 1.7 million acres (about 688,000 ha) in the central Beaufort Sea. This area is located offshore extending from a point 12 mi west of the community of Kaktovik (approximately 144° W. long.) to a point approximately 150° W. longitude (Fig. II.A-1). As a result of previous lease sales, 186 leases have been issued within the boundaries of Alternative I. As of January 1, 1998, there were 76 active leases in this area.

(2) Alternative II, No Sale: This alternative would remove the entire area of Alternative I from leasing.

(3) Alternative III, Kaktovik Deferral Alternative: This alternative would offer for leasing all the area described for Alternative I except for a subarea located in the eastern part of the proposed sale area. Alternative III would offer 278 blocks, comprising 1.3 million acres. The subareas removed by the Kaktovik Deferral Alternative consist of 85 blocks, approximately 416,573 acres, about 25 percent of the Alternative I area. The subarea deferral begins at the eastern boundary of the sale area approximately 12 mi west of Kaktovik (144° W. long.) and westward approximately 27 mi to the eastern boundary of the Kuvlum Unit (approximately 145° 7' W. long.). There are two active leases in this subarea deferral. The area that would be deferred includes blocks used for subsistence activities by the residents of Kaktovik; a portion of this area was recommended for deferral by Kaktovik, the NSB, and the AEWC for protection of subsistence-use zones and wildlife areas. Bowhead whales use the Kaktovik subarea deferral as part of the fall migration route and for feeding. The Inupiat residents of

Kaktovik use the subarea to hunt bowheads as well as polar bears, ringed seals, and migratory birds for subsistence purposes. This alternative would ensure that no exploration and development drilling would occur in the deferred blocks that may encompass a whale-feeding area.

(4) Alternative IV, Cross Island Area Alternative: In response to concerns raised during the comment and public hearings process, two new alternatives to Alternative I were included for analysis within the Final EIS. These are Alternatives IV and V, analyzed as option a, deferral of the area, and option b, special mitigation in lieu of deferral. Alternative IV (Cross Island Area) analyses an area included within a 10-mi radius around Cross Island. Alternative IV.a would defer an area consisting of 43 blocks out of the 363 offered by Alternative I and 51,251 ha out of 688,000 ha (Fig. II.D-1). The area that would be deferred under IV.a comprises about 7 percent of the area offered by Alternative I. Alternative IV.a would offer for leasing 320 blocks or 636,749 ha. Alternative IV.b analyzes the effects of special mitigating measures developed for protection in lieu of deferral. Alternative IV.b analyzes one proposed new stipulation developed for the Cross Island area.

The deferred area was suggested by the City of Nuiqsut, the NSB, the Arctic Slope Native Association (ASNA), and recommendations made by the AOAC. The area proposed for deferral encompasses a defined 10-mi radius around Cross Island—a location viewed by the community of Nuiqsut as their primary harvest and staging area for the subsistence hunting of the bowhead whale and other marine mammals. The deferral of a defined 10-mi radius around Cross Island analyzed in Alternative IV.a is a modification identified by the Nuiqsut whaling captains association in lieu of an earlier recommended 50-mi deferral identified during scoping and the public hearing. This defined 10-mi radius was presented to the AOAC, which supported its analysis as a deferral alternative in the Final EIS. The blocks offered in the Cross Island Area deferral alternative have been offered in other OCS lease sales and lie immediately offshore of active State and Federal leases, including the Northstar Unit. Currently, the COE is in the process of issuing a developmental Draft EIS on the Northstar Unit.

(5) Alternative V, Area Offshore of the ANWR: This alternative analyzes two options to protect areas offshore the ANWR. Alternative V.a analyzes the deferral of an area offshore the Refuge extending from the Federal/State OCS boundary out to the seaward limit of the sale area, from the eastern limit of the sale area (extending to 12 mi west of the community of Kaktovik) westward to a point approximately 146° W. longitude. The Alternative V.a area includes all of the Kaktovik Deferral, Alterative III, analyzed in the draft EIS and additional areas to the west and north to 146° W. longitude. (The Kaktovik Deferral would offer 278 blocks or 519,419 ha.) Alternative V.a (Area Offshore the ANWR) would defer 122 blocks out of the 363 offered by Alternative I and 250,164 ha out of 688,000 ha (Fig II.D-1). The area that would be deferred under Alternative V.a comprises about 36 percent of the area offered by Alternative I. Alternative V.a would offer for leasing 241 blocks or 437,866 ha. Alternative V.b analyzes the effects of special mitigating measures developed for protection in lieu of deferral. Alternative V.b analyzes three proposed new stipulations and three ITL's developed for the area offshore the ANWR in lieu of deferral.

More than 40 individuals raised the issue of protecting the ANWR largely in response to a Sierra Club letter on this subject. More than 55 individuals responded on behalf of the Teetl'it Gwich'in Council to protect the Porcupine Caribou Herd and prohibit any leasing offshore the ANWR. The FWS raised concerns regarding compliance with the Refuge Conservation Plan, which prohibits activities within the Refuge without FWS permission, and regarding the effects of oil spills on the Refuge. At the AOAC meeting in August 1997, the FWS also requested that this area be deferred until more information is available on the effects of OCS operations off the ANWR. This deferral alternative was requested by the AOAC; the City of Kaktovik; the NSB, the ASNA, several Canadian Native groups, including the Gwitchin Tribal Council, Teetl'it Gwich'in Council, the Ehditat Renewable Resource Council, Vuntut Gwitchin First Nation, and the Porcupine Caribou Management Board; environmental groups; and individuals.

b. Alternatives Not Selected for Inclusion in the EIS: Some alternatives identified during the scoping process or during previous EIS processes were determined to warrant no further analysis in the DEIS. The size of the proposed action is a more focused area and considerably smaller than the boundaries of the previous Sale 144 held in the Beaufort Sea. Alternatives identified during previous EIS processes that warrant no further analysis in the Draft EIS were covered in Section I.10 of the Sale 144 Final EIS. In the Sale 144 Final EIS, the alternatives considered in addition to the Proposal included: No Sale, the Barter Island Deferral, and the Nuiqsut Deferral. The Barter Island Deferral is outside of the proposed sale area considered for Sale 170. The Nuiqsut Deferral area is not being considered as an option for Sale 170, as discussed below. Additional alternatives that were suggested during the Sale 170 scoping but that are not recommended for inclusion in the EIS include the following.

(1) Delete All Blocks Within a 50-Mile Radius of Cross and Narwhal Islands (Nuiqsut Deferral): The NSB and the City of Nuiqsut initially recommended that all blocks within a 50-mi radius of Cross Island and Narwhal Island (part of the McClure Islands) be

deferred from leasing for protection of wildlife areas, subsistence-hunting areas, and high impact areas and, at a minimum, that all Sale 144 mitigating measures be applied to Sale 170. The NSB also supported a Nuiqsut Deferral similar to the area analyzed in the Sale 144 Final EIS and encouraged MMS to work directly with the City of Nuiqsut. Cross Island is a location viewed by the community of Nuiqsut and the Inupiat Whaling Commission as Nuiqsut's primary harvest area for the bowhead whale and other marine mammals.

This deferral area request was not analyzed as a separate alternative in the Draft EIS. A followup scoping meeting on January 10, 1997, with representatives of the City of Nuiqsut and the NSB, resulted in a determination that analysis of a Nuiqsut Deferral in the Sale 170 EIS would not provide any additional protection, and that it would not be productive to analyze a proposed 50-mi Nuiqsut Deferral in the Sale 170 EIS. Instead, the City of Nuiqsut and NSB representatives believe that developing additional stipulations to provide greater protection to sensitive subsistence-hunting areas, monitoring opportunities, and more direct consultation with lessees on exploration and development activities would be more effective than deferral requests. They requested that MMS focus on wording changes to Sale 170 stipulations to make it clear that lessees must work directly with Nuiqsut, the AEWC, and the Borough on a resolution process to include cumulative development activities. They clearly favored working with MMS to modify mitigating measures to include protective language in lieu of a Nuiqsut Deferral. Therefore, a Nuiqsut deferral was not analyzed in the Draft EIS. Instead, MMS worked closely with the local communities and whaling captains to develop additional protective language for mitigation of potential effects and monitoring, as they requested.

A similar but smaller deferral alternative (which included 234 blocks around Cross Island) analyzed in the Sale 144 EIS was not adopted by MMS.

In response to written comments and those submitted during the public hearings process, a Cross Island Area Deferral Alternative (IV.a) was added for the Final EIS. Additional protective mitigation language (IV.b) was included in a new stipulation to protect areas within a defined 10-mi radius of Cross Island from permanent OCS-production-facility siting and analyzed in lieu of deferral. The Cross Island Alternative was recommended by the AOAC; members representing the Borough and the City of Nuiqsut worked with MMS to assist in defining the 10-mi radius around Cross Island used by Nuiqsut whalers as a staging area for their whale-harvesting activities.

(2) Delete All Blocks Within a 50-Mile Radius of Barter Island: This deferral option was requested by the City of Kaktovik and was supported by the NSB. It extends from the eastern boundary of the proposed sale area westward to the western extent of the Kuvlum Unit. This option would ensure no exploration and development would occur in the deferred blocks. There are existing leases within this suggested deferral area, including the Kuvlum Unit, and blocks recently leased from Beaufort Sea Sale 144. The MMS adopted a number of mitigating measures for monitoring and protection of biological and subsistence resources; these stipulations are attached to the Sale 144 leases. These stipulations are considered part of the proposed Sale 170 area and will be analyzed to determine whether sufficient protection is afforded to biological and subsistence resources. The MMS considered this deferral request and developed a modified Kaktovik Deferral (Alternative III above), which excludes leased areas, including the Kuvlum Unit and adjacent blocks. The area requested for deletion within a 50-mi radius of Barter Island essentially is analysed in Alternative V.a, the area offshore the ANWR.

(3) Delete All Blocks Within the Area of the Canning River Eastward: This was requested during the Anchorage scoping meeting by an individual concerned with leasing off the ANWR and the effects to the Refuge; inevitable effects of onshore infrastructure within the Refuge; offshore development degrading the ANWR shoreline's wildlife and wilderness values, even if there were not onshore facilities; and harm from offshore activities that would affect barrier islands, lagoons, and shoreline of the Refuge. The commenter also noted that it is currently technically (or economically) infeasible to build 60 to 70 mi of subsea pipeline to develop the offshore leases in this area without going onshore and, therefore, leasing this OCS area would greatly increase the pressure to open the Refuge to oil development. This deferral request was considered by USDOI decisionmakers and determined not to be analyzed as a separate alternative in the Draft EIS for the following reasons: (1) most of the area requested for deferral lies eastward of the Sale 170 proposed area; (2) this area overlaps with the area being deferred by proposed Alternative III, the Kaktovik Deferral; and (3) active Federal offshore leases in this area, including blocks recently leased from Federal Beaufort Sea Sale 144 as well the Kuvlum Unit leases, include mitigating measures for monitoring and protecting biological and subsistence resources. State offshore leases extend contiguously out to the limit of State jurisdiction (to the 3-geographical-mile line) from the Canning River eastward to Camden Bay. There are no plans to open the Refuge to petroleum exploration and development.

In response to written comments and those submitted during the public hearings process, an Area Offshore of the ANWR Alternative was added for the Final EIS. Alternative V.a analyses the effects of the deferral. Additional protective language was included in three new stipulations and two new ITL's to protect the areas

offshore the ANWR. Alternative V.b analyses the effects of this special mitigation in lieu of deferral. This recommendation was requested by the FWS, environmental groups, and more than 40 individuals who raised the issue of protecting the ANWR.

(4) Delete All Blocks Off of the Colville River Delta: The City of Nuiqsut requested a deferral area off the Colville River Delta for protection of wildlife and subsistence rights for Nuiqsut residents. The Colville River Delta is located to the west of the proposed Sale 170 boundary. The boundaries of Alternative I exclude the offshore Federal area adjacent to the Colville River Delta from leasing at this time, rendering this deferral alternative moot. In regard to the Colville and Canning river deltas, most subsistence-related activities take place within the delta itself and within the 3-mi limit of State jurisdiction. Specifically of interest was the protection of anadromous fishes in the channels of the river delta. The State has leased several blocks for oil and gas exploration within the subject delta areas, and the USDOI has leased a number of blocks beyond the 3-mi limit off of the deltas. The issue of support facilities is one directly covered under the Coastal Zone Management policies of the NSB and as such will be dealt with as a Borough land use planning issue (please see Sec. IV.B.13).

(5) Deferral of Bowhead Whale Feeding Areas: The AEWC requested a deferral of all bowhead whale-feeding areas from leasing in the Beaufort Sea. A good part of the feeding area is outside of the proposed sale area.

3. Mitigating Measures:

a. Mitigating Measures Suggested During the Scoping Process: The following suggestions for mitigating measures to protect certain resources were received and are discussed below. Section II.D contains an extensive discussion of the details of the mitigating measures that are part of the alternatives.

(1) Stipulations: Stipulations 1 through 5 are considered part of all the alternatives. Special Stipulations 6 through 9 were developed to provide mitigation for two new alternatives (IV and V) based on comments submitted on the Draft EIS.

Stipulations Considered Part of All the Alternatives:
No. 1. Protection of Biological Resources
No. 2. Orientation Program
No. 3. Transportation of Hydrocarbons
No. 4. Industry Site-Specific Bowhead Whale-Monitoring Program
No. 5. Conflict Avoidance Mechanisms to Protect Subsistence Whaling and Other Subsistence Activities

Special Mitigation Developed for Alternative IV, Cross Island Area:
No. 6. Permanent Facility Siting in the Vicinity of Cross Island

Special Mitigation Developed for Alternative V, Area Offshore the Arctic National Wildlife Refuge:
No. 7. Planning for Activities Offshore the Arctic National Wildlife Refuge
No. 8. OCS Pipelines Offshore the Arctic National Wildlife Refuge
No. 9. Protection of Polar Bears From Proposed Development Offshore the Arctic National Wildlife Refuge

No.1, Protection of Biological Resources: If biological populations or habitats that may require additional protection are identified in the lease area by the Regional Supervisor, Field Operations (RS/FO), the RS/FO may require the lessee to conduct biological surveys to determine the extent and composition of such biological populations or habitats. Based on any surveys that the RS/FO may require of the lessee or on other information available to the RS/FO on special biological resources, the RS/FO may require the lessee to modify operations to ensure that significant biological populations or habitats deserving protection are not adversely affected.

No. 2, Orientation Program: The lessee shall include in any exploration or development and production plans submitted under 30 CFR 250.33 and 250.34 a proposed orientation program for all personnel involved in exploration or development and production activities (including personnel of the lessee's agents, contractors, and subcontractors) for review and approval by the RS/FO. The program shall be designed in sufficient detail to inform individuals working on the project of specific types of environmental, social, and cultural concerns that relate to the sale and adjacent areas.

No. 3, Transportation of Hydrocarbons: This measure requires the use of pipelines: (a) if pipeline rights-of-way can be determined and obtained; (b) if laying such pipelines is technologically feasible and environmentally preferable; and (c) if, in the opinion of the lessor, pipelines can be laid without net social loss, taking into account any incremental costs of pipelines over alternative methods of transportation and any incremental benefits in the form of increased environmental protection or reduced multiple-use conflicts.

No. 4, Industry Site-Specific Bowhead Whale-Monitoring Program: This stipulation mandates that lessees conduct a site-specific monitoring program during exploratory drilling activities, including seismic activities, to determine when bowhead whales are present in the vicinity of lease operations and the extent of behavioral effects on bowhead whales due to these activities. The

stipulation requires a peer review of monitoring plans and the resulting draft reports. The monitoring plan must include provisions for recording and reporting information on sightings of other marine mammals and must provide an opportunity for an AEWC or NSB representative to participate in the monitoring program. No monitoring program will be required if the RS/FO, in consultation with the NSB and the AEWC, determines that a monitoring program is not necessary based on the size, timing, duration, and scope of the proposed operations.

This stipulation was modified from the Draft EIS in response to a suggestion by NOAA to revise the range of avoidance behavior of bowhead whales to indicate subsistence hunters' observations of effects out to 35 mi (from 24 kilometers).

No. 5, Conflict Avoidance Mechanisms to Protect Subsistence Whaling and Other Subsistence Activities: This stipulation mandates that all exploration and development and production operations shall be conducted in a manner that prevents unreasonable conflicts between the oil and gas industry and subsistence activities, particularly the subsistence bowhead whale hunt. It also provides a mechanism to address unresolved conflicts between the oil and gas industry and subsistence activities.

This stipulation also requires the lessee to show in its exploration or development and production plan how its activities, in combination with other activities in the area, will be scheduled and located to prevent unreasonable conflicts with subsistence areas. This stipulation was modified in response to the City of Nuiqsut's concerns about cumulative effects from projected multiple development activities and to ensure that lessees work directly with the affected communities, the NSB, and the AEWC on consultation and consensus.

This title of this stipulation was changed in the Final EIS, as recommended by the AOAC, to recognize that this measure is really a conflict avoidance stipulation. Paragraph 2 of this measure identifies mechanisms to the lessee, such as a conflict avoidance agreement, to achieve consultation with affected communities and the NSB to assure activities are compatible with whaling and other subsistence hunting activities.

No. 6, Permanent Facility Siting in the Vicinity of Cross Island: This stipulation prohibits permanent OCS production facility siting within a defined 10-mile radius around Cross Island, unless the lessee can demonstrate that permanent facility siting will not preclude reasonable subsistence access for hunting of bowhead whales. It requires lessees to follow process and requirements for consultation with the AEWC and NSB for mitigation of unreasonable conflicts established under Stipulation No. 5.

This new stipulation was developed for Alternative IV, the Cross Island Area Alternative. This stipulation was requested by the State and the NSB in their comments on the Draft EIS, and agreed to by the AOAC. Stipulation 6 conforms to the State of Alaska's approach for leasing in the Beaufort Sea.

No. 7, Planning for Activities Offshore the Arctic National Wildlife Refuge: This stipulation applies to specific blocks located in the eastern Beaufort Sea offshore the ANWR and emphasizes existing restrictions or prohibitions on activities within and adjacent to ANWR. It requires that exploration and development and production plans must contain a description of proposed equipment staging areas, infrastructure, and other related activities and that lessees demonstrate the ability to stage and mobilize equipment, including oil spill response equipment, from locations other than the ANWR.

This new stipulation was developed for Alternative V, the Area Offshore the ANWR Alternative, to provide for protection of wildlife and habitats (both land and marine), subsistence, recreation, and other concerns identified by FWS, environmental groups, the Gwich'in Tribal Council, and individual commenters on the Draft EIS.

No. 8, OCS Pipelines Offshore the Arctic National Wildlife Refuge: This stipulation applies to specific blocks located in the eastern Beaufort Sea offshore the ANWR, and emphasizes that production from an OCS facility offshore the ANWR will not be allowed until a subsea pipeline has been constructed in offshore areas of the Beaufort Sea or areas with similar Arctic conditions. It requires that any proposal to construct a pipeline must address the methods for construction, maintenance, monitoring and repair of the pipeline under limiting seasonal conditions and restricted access from the ANWR.

This new stipulation was developed for Alternative V, the Area Offshore the ANWR Alternative, to provide for protection of wildlife and habitats (both land and marine), subsistence, recreation, and other concerns identified by FWS, environmental groups, the Gwich'in Tribal Council, and individual commenters on the Draft EIS.

No. 9, Protection of Polar Bears From Proposed Development Offshore the Arctic National Wildlife Refuge: This new stipulation addresses the need for information on effects to polar bears to be included in DPP environmental assessment. The purpose of this stipulation is to require lessees to provide information on measures to be taken to minimize effects to polar bears as part of their DPP; and that lessees may be required to conduct project-specific surveys related to polar bears. This stipulation applies to specific blocks located in the eastern Beaufort Sea offshore the ANWR.

This new stipulation was added in response to concerns raised by the FWS during the comment and public-hearings process. The FWS expressed concerns with regard to oil spills from subsea pipelines and polar bear protection during development.

(2) **Information to Lessees (ITL's):** No's. 1 through 21 apply to OCS activities in the Beaufort Sea area and are considered part of all the alternatives. The ITL's No's 22 and 23 were added for the Final EIS as special mitigation for Alternative V.b, the Area Offshore the ANWR, in response to concerns raised during the comment and public-hearings process. The ITL 15, Certification of Oil Spill Financial Responsibility, was modified to include a statement that the MMS will consult with the FWS and other affected parties to develop the basis for amounts required for facilities on the OCS near the ANWR.

No. 1. Information on Community Participation in Operations Planning
No. 2. Information on Kaktovikmiut Guide "In This Place"
No. 3. Information on Nuiqsutmiut Paper
No. 4. Information on the Arctic Biological Task Force
No. 5. Information on Bird and Marine Mammal Protection
No. 6. Information to Lessees on River Deltas
No. 7. Information on Endangered Whales and the MMS Monitoring Program
No. 8. The Availability of Bowhead Whales for Subsistence-Hunting Activities
No. 9. Information on Geological and Geophysical Survey Activity
No. 10. Information on Polar Bear Interaction
No. 11. Information on Spectacled Eider and Steller's Eider
No. 12. Information on Sensitive Areas to be Considered in Oil-Spill Contingency Plans
No. 13. Information on Oil-Spill-Cleanup Capability
No. 14. Information on Oil-Spill-Response Preparedness
No. 15. Certification of Oil Spill Financial Responsibility
No. 16. Information on Coastal Zone Management
No. 17. Information on Navigational Safety
No. 18. Information on Offshore Pipelines
No. 19. Information on Discharge of Produced Waters
No. 20. Information on Use of Existing Pads and Islands
No. 21. Information on Affirmative Action Requirements

Alternative V:
No. 22. Information on Activities on the Arctic National Wildlife Refuge
No. 23. Information on Consultation on Activities Offshore the ANWR

No. 1, Information on Community Participation in Operations Planning: This ITL's purpose is to encourage lessees to bring residents on the North Slope communities into their planning process. Local communities often have the best understanding of how oil and gas activities can be safely conducted in and around their area without harming the environment or interfering with community activities. Community representation on management teams that develop plans of operation and oil spill contingency plans that involve local community residents in the earliest stages of the planning process for proposed oil and gas activities can be beneficial to the industry.

No. 2, Information on Kaktovikmiut Guide "In This Place": The people of Kaktovik, the Kaktovikmiut, have compiled "A Guide for Those Wishing to Work in The Country of the Kaktovikmiut." The guide's intent, in part, is to provide information that may promote a better understanding of their concerns. Lessees are encouraged to obtain copies of the guide and to incorporate it into their Orientation Program to assist in fostering sensitivity and understanding of personnel to community values, customs, and lifestyles in areas in which they will be operating.

No. 3, Information on Nuiqsutmiut Paper: The people of Nuiqsut, the Nuiqsutmiut, have compiled a paper that provides information that may promote a better understanding of their concerns. Lessees are encouraged to obtain copies of this guide and to incorporate it into Orientation Programs to assist in fostering understanding and sensitivity to community values, customs, and lifestyles in areas in which they will be operating.

No. 4, Information on the Arctic Biological Task Force: This ITL advises lessees that in the enforcement of the Protection of Biological Resources stipulation, the RS/FO will consider recommendations from the Arctic Biological Task Force composed of designated representatives of the MMS, FWS, NMFS, and the USEPA.

No. 5, Information on Bird and Marine Mammal Protection: This ITL advises lessees that during the conduct of all activities related to leases issued as a result of this sale, the lessee and its agents, contractors, and subcontractors will be subject to the following laws, among others, the provisions of the MMPA of 1972, as amended (16 U.S.C. 1361 et seq.); the ESA, as amended (16 U.S.C. 1531 et seq.); and applicable International Treaties.

This ITL was modified in response to comments made by NOAA during the comment and public hearing process by deleting the reference on the need for specific regulations.

No. 6, Information on River Deltas: Lessees are advised that certain river deltas of the Beaufort Sea coastal plain (such as the Kongakut, Canning, and Colville) have been identified by the FWS as special habitats for bird-nesting and fish-overwintering areas, as well as other forms of wildlife. Shore-based facilities in these river deltas may be prohibited by the permitting agency.

No. 7, Information on Endangered Whales and MMS Monitoring Program: This ITL advises lessees that the MMS intends to continue its areawide endangered whale-monitoring program in the Beaufort Sea during exploration activities. The program will gather information on whale distribution and abundance patterns and will provide additional assistance to determine the extent, if any, of adverse effects to the species.

No. 8, The Availability of Bowhead Whales for Subsistence Hunting Activities: Lessees are advised that the NMFS issued regulations for incidental take of marine mammals, including bowhead whales. Incidental-take regulations are promulgated only upon request, and the NMFS must be in receipt of a petition prior to initiating the regulatory process. Incidental takes of bowhead whales are allowed only if a Letter of Authorization (LOA) is obtained from the NMFS pursuant to the regulations in effect at the time. An LOA must be requested annually. In issuing an LOA, the NMFS must determine that proposed activities will not have an unmitigable adverse effect on the availability of the bowhead whale to meet subsistence needs by causing whales to abandon or avoid hunting areas, directly displacing subsistence users, or placing physical barriers between whales and subsistence users.

No. 9, Information on Geological and Geophysical Survey Activity: This ITL advises lessees of the potential effects of geological and geophysical (G&G) activity to bowhead whales and subsistence hunting activities, and reminds lessees of the specifics of the bowhead whale-monitoring program. This ITL also informs lessees that MMS intends to treat prelease G&G activities in a manner similar to the postlease G&G activities. The MMS may impose restrictions (including the timing of operations relative to open water) and other requirements (such as having a locally approved coordinator on board) on G&G surveys to minimize unreasonable conflicts between the G&G survey and subsistence whaling activities. Lessees will coordinate any proposed G&G activity with potentially affected subsistence communities, the NSB, and the AEWC to identify potential conflicts and develop plans to avoid these conflicts.

No. 10, Polar Bear Interaction: Lessees are advised that polar bears may be present in the area of operations, particularly during the solid-ice period. Lessees should conduct their activities in a manner that will limit potential encounters and interaction between lease operations and polar bears.

This ITL was modified at the request of the FWS to inform lessees to contact the FWS regarding proposed operations and actions that might be taken to minimize interactions with polar bears.

No. 11, Information on Spectacled Eider and Steller's Eider: Lessees are advised that the spectacled eider (*Somateria fischeri*) and Steller's eider (Polysticta stelleri) are listed as threatened by the FWS and are protected by the ESA of 1973, as amended, 16 U.S.C. 1531 et seq.

At the request of the FWS, this ITL was modified to add language identifying specific times when spectacled eiders may be present in the area, and to include the Steller's eider as threatened under the ESA.

No. 12, Information on Sensitive Areas To Be Considered in the Oil-Spill Contingency Plans (OSCP's): Lessees are advised that certain areas are especially valuable for their concentrations of marine birds, marine mammals, fishes, or other biological resources or cultural resources, and for their importance to subsistence harvest activities, and should be considered when developing OSCP's.

This ITL was changed from the Draft EIS to correspond to the State of Alaska's Sale 86 lessee advisory.

No. 13, Information on Oil-Spill-Cleanup Capability: Exploratory drilling, testing, and other downhole activities may be prohibited in broken-ice conditions unless the lessee demonstrates to the RS/FO the capability to detect, contain, clean up, and dispose of spilled oil in broken ice.

No. 14, Oil-Spill-Response Preparedness: Lessees are advised that they must be prepared to respond to oil spills which could occur as a result of offshore oil and gas exploration and development activities. With or prior to submitting a plan of exploration or a development and production plan, the lessee will submit for approval an oil-spill-contingency plan in accordance with 30 CFR 250.42.

No. 15, Certification of Oil Spill Financial Responsibility: Lessees are advised that Section 1016(c)(1) of the Oil Pollution Act (OPA) of 1990 (33 U.S.C. 2716(c)(1), as amended) requires that lessees establish and maintain evidence of oil spill financial responsibility. The authority to administer this provision was transferred from the U.S. Coast Guard (USCG) to the MMS. This ITL notifies lessees of proposed new implementation regulations at 30 CFR 253, which would incorporate an amount for oil spill financial responsibility for oil exploration, production, and transportation facilities on the OCS that can vary between a minimum of $35 million and a maximum of $150 million, depending upon potential clean-up and damages costs, including environmental considerations. Lessees are advised that, following publication of a final rule, the MMS will consult with the USFWS to develop the basis for the amounts required to be evidenced for facilities on the OCS near the Arctic Wildlife Refuge.

This ITL was modified to reflect proposed revisions to the regulation.

No. 16, Information on Coastal Zone Management: Lessees are advised that the State of Alaska will review OCS plans through the review process for consistency with the Alaska Coastal Management Program. Oil-spill-contingency plans will be reviewed for compliance with State standards, the use of best available and safest technologies, and with State and regional contingency plans on a case-by-case basis.

No. 17, Information on Navigational Safety: Operations on some of the blocks offered for lease may be restricted by designation of fairways, precautionary zones, anchorages, safety zones, or traffic-separation schemes established by the USCG pursuant to the Ports and Waterways Safety Act (33 U.S.C. 1221 et seq.), as amended.

No. 18, Information on Offshore Pipelines: This ITL advises lessees that the Department of the Interior and the Department of Transportation have entered into a Memorandum of Understanding, dated December 10, 1996, concerning the design, installation, operation, inspection, and maintenance of offshore pipelines. Bidders should consult both departments for regulations applicable to offshore pipelines.

This ITL was changed to reflect the revised Memorandum of Understanding.

No. 19, Information on Discharge of Produced Waters: This ITL advises lessees that the State of Alaska prohibits discharges of produced waters on State tracts within the ten-meter depth contour. It informs lessees that discharges of produced waters into marine waters are subject to conditions of NPDES permits issued by the USEPA, and may also include a zero-discharge requirement on Federal tracts within the 10-meter depth contour.

No. 20, Information on Use of Existing Pads and Islands: This ITL advises lessees that during the review and approval process for exploration and development and production plans, MMS will encourage lessees to use existing pads and islands wherever feasible.

No. 21, Information on Affirmative Action Requirements: Revision of Department of Labor regulations on affirmative action requirements for Government contractors (including lessees) has been deferred, pending review of those regulations (see *Federal Register* of August 25, 1981, at 46 *FR* 42865 and 42968).

No. 22, Information on Activities on the Arctic National Wildlife Refuge: This ITL advises lessees of land use restrictions within the ANWR, and that the Refuge is managed by the U.S. Fish & Wildlife Service.

This ITL was added in response to concerns raised during the comment and public hearings process.

No. 23, Information on Consultation on Activities Offshore the ANWR: This ITL advises lessees of MMS consultations with the U.S. Fish & Wildlife Service regarding any OCS pipelines to be constructed offshore the Arctic Refuge in formulating any special terms or measures necessary to protect the ANWR.

This ITL was added in response to concerns raised during the comment and public hearings process.

b. Mitigating Measures Not Considered in This EIS: The following mitigating measures identified by commenters were considered but are not analyzed in the EIS.

(1) Prohibit All Offshore Oil and Gas Exploration Activity during Active Bowhead Subsistence-Whale Hunting: The AEWC is concerned with interference of subsistence-whaling activities due to seismic work during the fall open-water season. The AEWC requested that MMS prohibit all offshore oil and gas exploration during active subsistence-bowhead hunting. Such a measure was considered but determined not necessary for this EIS. The NMFS' arcticwide biological opinion indicates that exploratory drilling and associated activities during the bowhead migration are not likely to jeopardize the continued existence of that species. Protection of the endangered whale would be achieved through monitoring, implementation of internal safety and antipollution requirements, and compliance with conservation recommendations included in the NMFS' biological opinion. Specific mitigation was developed for Beaufort Sea Sale 144 to ensure there would be no adverse effects during exploratory activities. The same mitigation is considered a part of the alternatives for Sale 170. The Subsistence Whaling and Other Subsistence Activities stipulation requires all lessees to conduct exploration and development and production operations in a manner that minimizes any potential conflict between the oil and gas industry and subsistence hunters. It requires lessees to consult with potentially affected communities, the NSB, and the AEWC to discuss potential conflicts, and includes a mechanism for conflict resolution when no agreement can be reached during the consultation process.

The MMS also may impose other restrictions in enforcing this stipulation, such as seasonal or directional drilling restrictions, seismic and threshold depth restrictions, or use of other technologies. The industry site-specific monitoring program developed for Sale 144 requires

lessees to conduct site-specific monitoring during seismic activities in addition to exploration and development drilling activities occurring within the bowhead fall migration periods to determine when whales are present and if they exhibit any behavioral disturbances due to the activities. It also requires procedures for peer review, including the AEWC and the NSB participation in peer review and as observers, and for including information provided by local subsistence hunters on observations regarding bowhead avoidance behaviors. Similar requirements may be imposed by NMFS through their Incidental Harassment Authorizations and Plans of Cooperation.

(2) Suspend Seismic Activity in Polar Bear Denning Areas: The FWS indicated that a suspension of seismic activity in polar bear denning areas between October 30 and April 25 would be preferable to continuing activities during denning. Their request was considered but it was determined that sufficient mitigation protection exists with the ITL on polar bear interaction. The FWS recommended this ITL from Sale 144 be adopted for Sale 170. This ITL is considered part of the alternatives for Sale 170 and provides the protections requested by FWS. If the lessees contact FWS as advised, most of the potential interaction with polar bears as a result of operations will be minimized, because FWS can advise lessees of areas to avoid due to possible den locations. A suspension of activities from October to April would leave very little time to conduct operations such as seismic surveys, because seismic surveys may be precluded during much of September and part of October due to subsistence whaling in accordance with lessee agreements with local whaling communities or the AEWC.

(3) Seasonal Drilling Restriction Is Needed During Bowhead Whale Migration: This mitigation was requested during the Anchorage scoping meeting and considered and determined not be analyzed in this EIS for the same rationale as identified for the requested measure to prohibit activities during active subsistence-whaling activities. The protective mitigation measures developed for Sale 144 are considered part of the alternatives for Sale 170. Such mitigation affords the same protection to the bowhead whale during migration.

(4) Modify Stipulations to Include Cumulative Effects of Other Activities: This mitigation was requested during the Nuiqsut scoping meeting and reinforced by AEWC and the NSB. It is believed that modifications to the industry site-specific bowhead whale monitoring program and subsistence whaling and other subsistence activities stipulations, as agreed to with Nuiqsut and the NSB representatives during the second Nuiqsut Scoping Meeting held in Anchorage on January 10, 1997, adequately will address expressed concerns. The MMS worked with the NSB, AEWC, the City of Nuiqsut, industry and the AOAC on this measure to reflect that the stipulation is really a conflict avoidance mechanism; the title of the measure was revised to reflect this.

(5) ITL on Consultation with NMFS to Protect Bowhead Whales in the Spring-Lead System: This ITL was included in the Final EIS and Notice of Sale for Beaufort Sea Sale 144. Several commenters requested that all mitigation adopted for Sale 144 also be required in Sale 170. This ITL applied to development and production activities in the spring lead systems used by bowhead whales along the Chukchi Sea coast and extending to the northeast of Point Barrow. Thus, this ITL applies to an area outside of the Sale 170 area encompassed by proposed Sale 170 and is not applicable.

D. INDIAN TRUST RESOURCES: The MMS anticipates that the alternatives for Sale 170 will have no significant effects on Indian Trust Resources. The Federal Government does not recognize the validity of claims of aboriginal title, and associated hunting and fishing rights, that have been asserted for unspecified portions of the sale area. However, while MMS does not recognize these resources as Indian Trust Resources, this EIS considers the potential effects of lease-sale activities on Native Alaskan communities as they relate to economics, subsistence harvest patterns, and sociocultural systems.

E. EXECUTIVE ORDER (E.O.) 12898, ENVIRONMENTAL JUSTICE: The environmental-justice policy based on E.O. 12898 requires agencies to incorporate environmental justice into their missions by identifying and addressing environmental effects of their proposed programs on minorities and low-income populations and communities. The USDOI has developed guidelines in accordance with the Presidential Executive Order on Environmental Justice. The MMS participated in the development of these guidelines. The MMS's existing process of involving all affected communities and Native American and minority groups in the NEPA-compliance process meets the intent and spirit of the E.O. However, we are continuing to identify ways to improve the input from all Alaskan residents, not only in commenting on official documents but also contributing their knowledge to the scientific and analytical sections of the EIS.

Environmental justice concerns generally were identified during the scoping process for Sale 170. The potential effects of Sale 170 on the issues raised by these concerns are addressed in those sections that analyze the effects of the sale on the Subsistence-Harvest Patterns, Sociocultural Systems, and marine mammals.)See Sec. IV.B.10.d for a detailed discussion of environmental justice.)

F. EIS STREAMLINING: Readers of this Sale 170 Draft EIS are alerted to some noticeable differences in this EIS as compared to previous Alaska OCS EIS's. To provide a more concise, reader-friendly, and useful analysis of potential effects and impacts of proposed activities, MMS has begun to streamline its EIS's. For example, the previous Beaufort Sea Sale 144 analysis of environmental effects presented three separate cases (low, base, and high); the Sale 170 EIS treats a composite of this information in a single-case analysis. This single case represents the most likely development activity associated with a reasonable range of resources estimated for the Sale 170 area given the uncertainties of geology, engineering, and economics that exist now.

Beaufort Sea Proposed Sale 170 closely follows completion of the Beaufort Sea Sale 144 held in September 1996. The MMS issued the Final EIS for Sale 144 in May 1996. Sale 170, tentatively scheduled for August 1998, is a proposed small, focused sale in the central Beaufort Sea and lies entirely within the earlier Sale 144 area. The Sale 170 Draft EIS analyzes new, significant information, and relevant background information from the Sale 144 Final EIS is incorporated by reference. Such streamlining and use of incorporation by reference follows the intent of the CEQ regulations in 40 CFR Section 1502.21. The CEQ encourages agencies to incorporate by reference material into an EIS when the effect cuts down on bulk without impeding agency analysis and public review of the action. In this EIS, the MMS cited the incorporated material and briefly described its content. All material incorporated by reference is reasonably available for inspection by interested persons within the public comment period and is available in local public libraries and from the MMS Alaska OCS Region.

G. SIGNIFICANT DIFFERENCES BETWEEN THE DRAFT EIS AND THE FINAL EIS: The following summarizes the significant changes that have been made in the Final EIS as a result of the public review of the Draft EIS. These changes include (1) the addition of two alternatives; (2) additional analysis of effects removed as a result of deferral in Alternatives III, IV.a, and V.a.; (3) revisions to two stipulations; (4) the addition of four stipulations; (5) the addition of two ITL's and revisions to five ITL's; and (6) the analysis of several additional factors, including significant text revisions.

- Two alternatives were added to the Final EIS in response to comments expressing concerns related to subsistence-hunting areas in the vicinity of Cross Island and for the protection of resources offshore the ANWR. The Cross Island Area, Alternative IV, and the Area Offshore the ANWR, Alternative V are analyzed with option a, which analyzes deferral of the area and option b, which analyzes the use of special mitigation in lieu of deferral.

- Alternatives III, IV.a, and V.a of the Final EIS contain an additional analysis of effects removed as a result of area deferral.

- The two revised stipulations are Stipulation 4, Industry Site-Specific Bowhead Whale-Monitoring Program, and Stipulation 5, Conflict Avoidance Mechanisms to Protect Subsistence Whaling and Other Subsistence Activities. Stipulation 4 was rewritten to clarify whale-avoidance distances identified by subsistence hunters out to 35 mi. Stipulation 5 was changed in the title and text to clarify that this stipulation is really a conflict resolution stipulation.

- The five revised ITL's are ITL 5, Information on Bird and Marine Mammal Protection; 11, Information on Spectacled Eider and Steller's Eider; 12, Information on Sensitive Areas to be Considered in the Oil-Spill Contingency Plans; 15, Certification of Oil Spill Financial Responsibility; and 18, Information on Offshore Pipelines. These ITL's were revised based on comments submitted during the comment and public hearing process.

- One potential new stipulation, Stipulation 6, Permanent Facility Siting in the Vicinity of Cross Island, was added to the Final EIS to protect subsistence-hunting areas around Cross Island. This stipulation was developed for Alternative IV, the Cross Island Area Alternative. Stipulation 6 prohibits permanent OCS production facility siting within a defined 10-mile radius around Cross Island, unless the lessee can demonstrate that permanent facility siting will not preclude reasonable subsistence access for hunting of bowhead whales. It requires lessees to follow process requirements for consultation with the AEWC and NSB and mitigation of unreasonable conflicts established under Stipulation 5. This stipulation was requested by the State and the NSB in their comments on the Draft EIS, and agreed to by the AOAC. Stipulation 6 conforms to the State of Alaska's approach for leasing in the Beaufort Sea.

- Three potential stipulations were added to the final EIS to protect the area offshore the ANWR:

  Stipulation 7, Planning for Activities Offshore the Arctic National Wildlife Refuge. This new stipulation was developed for Alternative V, the Area Offshore the ANWR Alternative, to provide for protection of wildlife and habitats (both land and marine), subsistence, recreation, and other concerns identified by the FWS, environmental groups, the Gwich'in Tribal Council, and individual commenters on the Draft EIS. This stipulation applies to specific blocks located in the eastern Beaufort Sea offshore the ANWR and emphasizes restrictions or prohibitions on activities with and adjacent to the ANWR. It requires that exploration and development and production plans must contain a description of proposed equipment-staging areas, infrastructure, and other related

activities, and that lessees demonstrate the ability to stage and mobilize equipment, including oil-spill-response equipment, from locations other than the ANWR.

Stipulation 8, OCS Pipelines Offshore the Arctic National Wildlife Refuge. This new stipulation was developed for Alternative V, the Area Offshore the ANWR Alternative, to provide for protection of wildlife and habitats (both land and marine), subsistence, recreation, and other concerns identified by the FWS, environmental groups, the Gwich'in Tribal Council, and individual commenters on the Draft EIS. This stipulation applies to specific blocks located in the eastern Beaufort Sea offshore the ANWR and emphasizes that production from an OCS facility offshore the ANWR will not be allowed, until a subsea pipeline has been constructed in offshore areas of the Beaufort Sea or areas with similar arctic conditions. It requires that any proposal to construct a pipeline must address the methods for construction, maintenance, monitoring, and repair of the pipeline under limiting seasonal conditions and restricted access from the ANWR.

Stipulation 9, Protection of Polar Bears From Proposed Development Offshore the Arctic National Wildlife Refuge. This new stipulation was developed at the request of FWS concerns with regard to oil spills from subsea pipelines and polar bear protection during development. This new stipulation addresses the need for information on effects to polar bears to be included in DPP environmental assessment. The purpose of this stipulation is to require lessees to provide information on measures to be taken to minimize effects to polar bears as part of their DPP; and that lessees may be required to conduct project-specific surveys related to polar bears. This stipulation applies to specific blocks located in the eastern Beaufort Sea offshore the ANWR.

- The two new ITL's that were added to the Final EIS were developed for the area offshore the ANWR.

ITL 22, Information on Activities on the Arctic National Wildlife Refuge, informs lessees of land use restrictions within the ANWR, and advises that the Refuge is managed by the FWS.

ITL 23, Information on Consultation on Activities Offshore the ANWR, was developed by MMS to highlight how existing regulations provide the mechanism to protect the area offshore the ANWR. Its purpose is to inform lessees of MMS consultations with the FWS regarding any OCS pipelines to be constructed offshore the Refuge in formulating any special terms or measures necessary to protect the ANWR.

- Significant text revisions focused on major issues dealing with marine mammals, subsistence, the bowhead whale, and sociocultural activities affected by environmental justice. These sections incorporated new information on the effect of noise (particularly on the bowhead whale) as well as the addition of sources of traditional knowledge. In response to comments on the Draft EIS, the section on the bowhead whale was considerably expanded rather than incorporating by reference sections of the Sale 144 Final EIS. Where comments warranted other changes or presented new or additional information, revisions were made to the appropriate text in the EIS.

SECTION II

ALTERNATIVES

A. ALTERNATIVE I

1. **Resource Estimates and Developmental Scenario**
2. **Timing of Activities**

B. ALTERNATIVE II - NO LEASE SALE

C. ALTERNATIVE III - KAKTOVIK DEFERRAL

D. ALTERNATIVE IV - CROSS ISLAND AREA

E. ALTERNATIVE V - AREA OFF-SHORE THE ANWR

F. MITIGATING MEASURES THAT ARE PART OF THE ALTERNATIVES

1. **Stipulations**
   - No. 1, Protection of Biological Resources
   - No. 2, Orientation Program
   - No. 3, Transportation of Hydrocarbons
   - No. 4, Industry Site-Specific Bowhead Whale-Monitoring Program
   - No. 5, Conflict Avoidance Mechanisms to Protect Subsistence Whaling and Other Subsistence Activities
     Special Mitigation Applicable to Alternative IV, Cross Island Area
   - No. 6, Permanent Facility Siting in the Vicinity of Cross Island
     Special Mitigation Applicable to Alternative V, Area Offshore the Arctic National Wildlife Refuge
   - No. 7, Planning for Activities Offshore the Arctic National Wildlife Refuge
   - No. 8, OCS Pipelines Offshore the Arctic National Wildlife Refuge
   - No. 9, Protection of Polar Bears from Proposed Development Offshore the Arctic National Wildlife Refuge

2. **Information to Lessees**
   - No. 1, Information on Community Participation in Operations Planning
   - No. 2, Information on Kaktovikmiut Guide *In This Place*
   - No. 3, Information on Nuiqsutmiut Paper
   - No. 4 Information on the Arctic Biological Task Force
   - No. 5, Information on Bird and Marine Mammal Protection
   - No. 6, Information on River Deltas
   - No. 7, Information on Endangered Whales and MMS Monitoring Program
   - No. 8, Information on the Availability of Bowhead Whales for Subsistence-Hunting Activities
   - No. 9, Information on Geological and Geophysical Survey Activity
   - No. 10, Information on Polar Bear Interaction
   - No. 11, Information on the Spectacled Eider and Steller's Eider
   - No. 12, Information on Sensitive Areas to be Considered in Oil-Spill-Contingency Plans
   - No. 13, Information on Oil-Spill-Cleanup Capability
   - No. 14, Information on Oil-Spill-Response Preparedness
   - No. 15, Information on Certification of Oil Spill Financial Responsibility
   - No. 16, Information on Coastal Zone Management
   - No. 17, Information on Navigational Safety
   - No. 18, Information on Offshore Pipelines
   - No. 19, Information on Discharge of Produced Waters
   - No. 20, Information on Use of Existing Pads and Islands
   - No. 21, Information on Affirmative Action Requirements
     Special Mitigation Applicable to Alternative V, Area Offshore the Arctic National Wildlife Refuge
   - No. 22, Information on Activities on the Arctic National Wildlife Refuge
   - No. 23, Information on Consultation on Activities Offshore the Arctic National Wildlife Refuge

G. COMPARISON OF THE EFFECTS OF THE ALTERNATIVES AND THE CUMULATIVE CASE

1. **Effects on Water Quality**
2. **Effects on Lower Trophic-Level Organisms**
3. **Effects on Fishes**
4. **Effects on Endangered and Threatened Species**
   - Bowhead Whale
   - Spectacled Eider
   - Steller's Eider
   - Arctic Peregrine Falcon
5. **Effects on Marine and Coastal Birds**
6. **Effects on Pinnipeds, Polar Bears, and Belukha Whales**
7. **Effects on Caribou**
8. **Effects on the Economy of the North Slope Borough**
9. **Effects on Subsistence-Harvest Patterns**
10. **Effects on Sociocultural Systems**
11. **Effects on Archaeological Resources**
12. **Effects on Air Quality**
13. **Effects on Land Use Plans and Coastal Management Programs**

II. ALTERNATIVES

This section introduces and summarizes Alternative I (the entire sale area); the No Lease-Sale Alternative, Alternative II; the Kaktovik Deferral Alternative, Alternative III; the Cross Island Area Alternative, Alternative IV; and the Area Offshore the Arctic National Wildlife Refuge (ANWR) Alternative, Alternative V. The environmental effects of these alternatives are analyzed in detail in Sections IV.B, C, D, E, and F, respectively. Also discussed as potential consequences of Alternative I are a natural gas analysis and a low-probability high-effects case. In the first instance, even though natural gas is not considered economical to produce, its potential effects are considered in Section IV.J. In the second instance, the effects of a major oil spill (160,000 barrels [bbl]) are considered (Sec. IV.L).

The U.S. Department of the Interior's (USDOI's) preferred alternative at this time is a combination of Alternative IV.b (Cross Island special mitigation), Alternative V.a (deferral of the area offshore the ANWR), and the mitigation (stipulations and Information to Lessees Clauses [ITL]) as applied to Alternative I.

A. ALTERNATIVE I: Alternative I would offer for leasing the entire proposed sale area, including 363 whole and partial blocks encompassing approximately 688,000 hectares (ha) (1.7 million acres) of the Beaufort Sea. This area is located offshore the area extending from a point 12 miles (mi) west of the community of Kaktovik (approximately 144° W. longitude) to a point approximately 150° W. longitude (Fig. II.A-1). Figure II.A-2 shows Alternative I in relation to existing leases and potential oil-production areas that have been unitized.

1. Resource Estimates and Developmental Scenario: For Alternative I, the range of potential resources varies from 350 to 670 million barrels (MMbbl) of oil produced over the anticipated >21-year life of the field (Appendix A, Table A-2). This is based on an assumed range of values for a barrel of produced crude oil that varies between $18 and $30 over the life of the field. Table A-2 of Appendix A and Table IV.A.1-1 show the infrastructure and timeframes for the development of this resource. Section IV contains analyses of the effects of Alternative I on the physical, biological, and sociocultural environment.

2. Timing of Activities: The level of activities and the timing of events associated with the resource estimate for Alternative I are shown in Table IV.A.1-1 and Appendix A. Exploratory drilling is expected to begin in 1999 and continue through 2006. During these years, a total of 12 to 16 exploration and delineation wells would be drilled, with a maximum of two drilling rigs operable in any one exploratory year. Between 2004 and 2009, three to

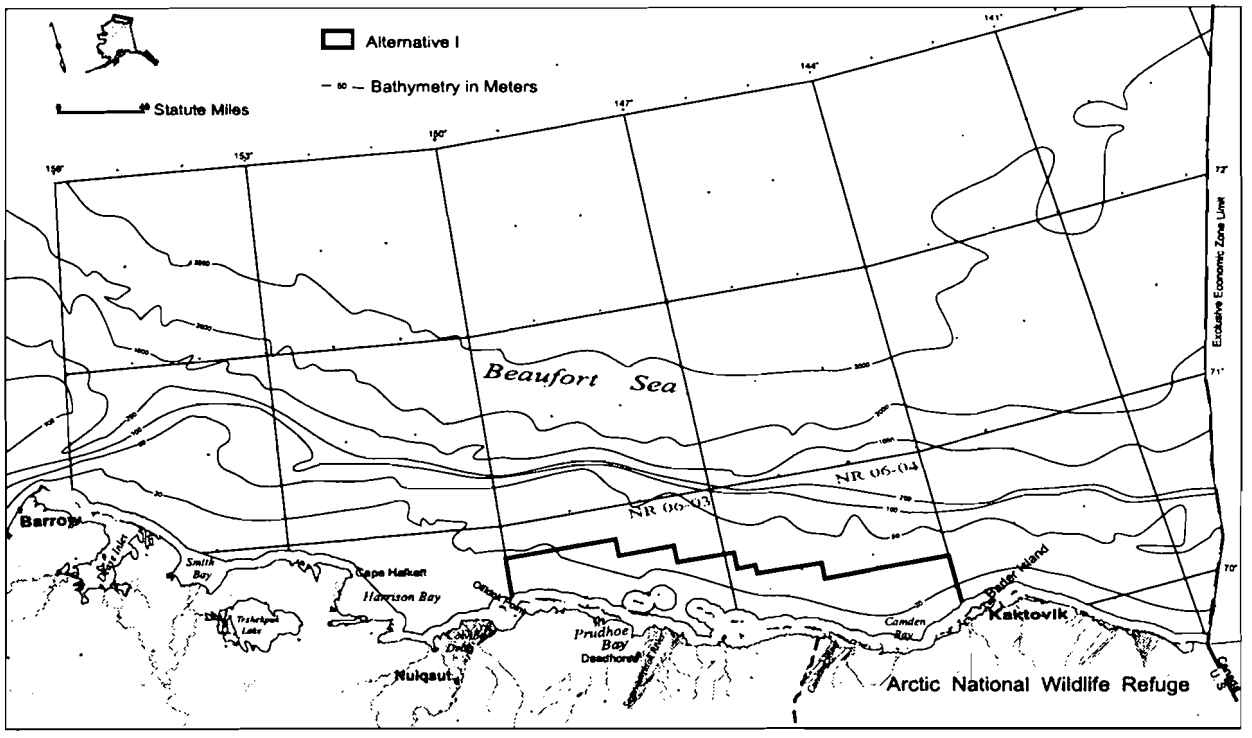
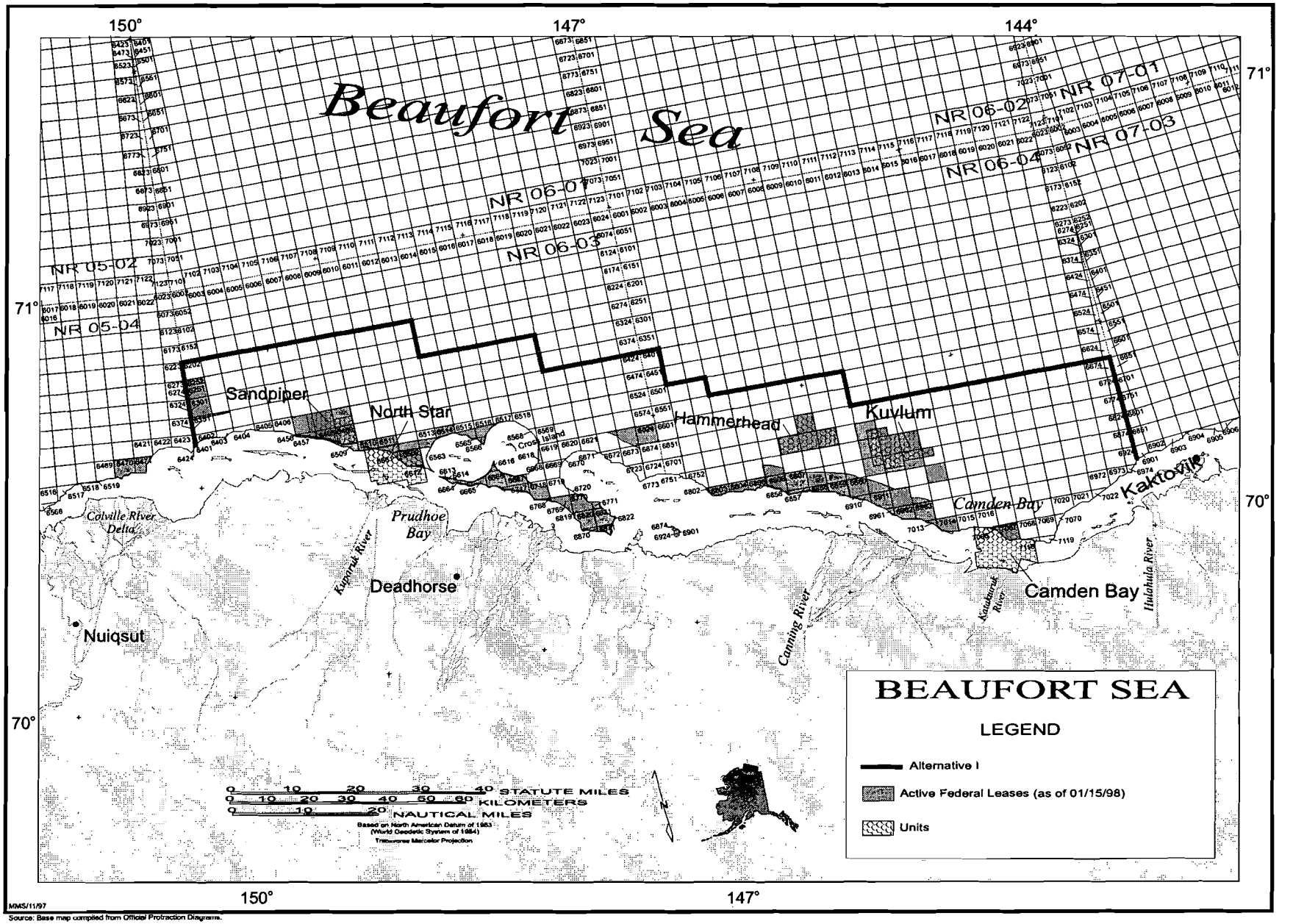


Figure II.A.1 Alternative I



Source: Base map compiled from Official Protraction Diagrams.

Figure II.A.2 Alternative I

five production platforms are expected to be installed, while pipeline laying is expected to begin in 2005 and conclude in 2010. Production- and service-well drilling is expected to begin in 2004 and continue through 2010, with a total of 87 to 111 wells drilled. Production is expected to begin in 2006 and continue through 2027.

The type of units that may be used in exploration and production drilling would depend on water depth, sea-ice conditions, ice-resistant capabilities of the units, and availability of drilling units. Artificial-ice islands are likely to be employed as drilling platforms in shallow-water nearshore areas (<12-meters [m] [<40 ft]). Construction and resupply operations for ice-island drilling platforms would be supported by ice roads. Bottom-founded platforms of various designs are most likely to be used to drill prospects farther offshore in water depths of 10 to 25 m (35-80 ft); and because of mobile ice conditions, these operations would be supported by supply boats during the open-water season. For water depths >25 m (>80 ft), floating drill rigs (drillships or floating concrete platforms) would be employed to drill exploration wells in open-water or broken-ice conditions. These far-offshore operations would be supported by icebreaker-support/supply ships, with support and supply operations staging from existing Prudhoe Bay/Kuparuk infrastructure.

Produced crude oil would be transported via pipeline to intermix with the onshore Prudhoe Bay and/or Kuparuk pipeline systems. Produced crude would be transported to Valdez via the Trans-Alaska Pipeline System (TAPS) and then to the U.S. West Coast and possibly the Far East via tanker. A more detailed discussion of the transportation scenario for Alternative I is contained in Section IV.A.1.

The economic field-size threshhold for active resource exploration and/or extraction of oil is 350 MMbbl at $18 per barrel. Should either the field size be less or world prices for crude oil fall below $18 per barrel, an exploration-only situation may occur. Thus, activities associated with this alternative are considered to be exploration only, with no resulting production or development. Exploratory drilling should begin by 1998 and cease by 2006, with four wells drilled by a single rig. All support functions would be staged from Prudhoe Bay facilities (see Appendix A, Table A-1 and Table IV.A.1-1).

B. ALTERNATIVE II - NO LEASE SALE: This alternative would be equal to cancellation of Sale 170. As a result of such a cancellation, the oil estimated to be produced under Alternative I would be neither discovered nor developed. Should the sale not be held, the energy that would have flowed into the U.S. economy from resources leased under this sale would need to be provided by substitute sources.

Possible substitutes for the resources expected to be produced as a result of Alternative I include:

- Oil-supply substitutes
  - Domestic onshore oil production
  - Imported oil
- Fuel substitutes in the transportation sector
  - Imported methanol
  - Gasohol
  - Compressed natural gas
  - Electric cars
- Conservation
  - In the transportation sector
  - Reduced consumption of plastics

For the no-sale alternative, substitute energy flows probably would be provided by a mix of the substitutes listed above. The mix would depend on economic and regulatory factors as well as the short-run availability of the capacity to produce and transport sufficient quantities of the various substitutes. Section IV.C offers a more extensive discussion of the no-sale alternative, including the environmental effects associated with this alternative.

C. ALTERNATIVE III - KAKTOVIK DEFERRAL: This alternative would result in the offering of 278 blocks or 519,419 ha (1.3 million acres), approximately 75 percent of Alternative I (Fig. II.C-1). This alternative was drafted to delete blocks from the area approximately 12 mi west of the community of Kaktovik (144° W. longitude) to a line approximating 145°07' W. longitude. The area that would be deferred under Alternative III includes blocks used for subsistence activities by the residents of the community of Kaktovik. This alternative would ensure that no exploration and development would occur in the deferred blocks, which also may encompass a whale-feeding area; the potential for oil spills or use conflicts originating from the unoffered portion of the planning area would be reduced accordingly. Deferring this area was supported by the U.S. Fish and Wildlife Service (FWS) and Native groups during the scoping process for Sale 170.

The estimated resources for the sale if Alternative III is adopted range from roughly 240 MMbbl to about 480 MMbbl, approximately 30 percent less than estimated for the resource estimate of Alternative I. Again, this production range is based on oil selling for $18 to $30 a barrel. The general exploration and development and production profile of this alternative is very similar that of the resource estimate of Alternative I. Table A-4 in Appendix A contains the specific development and production profiles for Alternative III.

Alternative III activities would be supported from marine and air facilities located in and around Prudhoe Bay/ Kuparuk. Produced crude would be transported to Valdez via the TAPS and then to the U.S. West Coast and possibly the Far East via tanker. A more detailed discussion of the

transportation scenario for Alternative III is contained in Section IV.A.1.

D. ALTERNATIVE IV - CROSS ISLAND AREA:

Alternative IV is examined in this EIS as two options: option IV.a analyzes the effects of deferring 43 blocks, approximately 7 percent of the sale area; option IV.b analyzes the effects of special mitigation in lieu of deferral. Alternative IV.a would result in the offering of 320 blocks or 636,749 ha (1.6 million acres), approximately 93 percent of Alternative I (Fig. II.C-1). This alternative was drafted to delete blocks within a defined 10-mi radius around Cross Island, eliminating the possibility of space-use conflicts and minimizing noise disturbance to migration routes of bowhead whales and subsistence-harvest areas by the residents of Nuiqsut. The deferred area was suggested by the City of Nuiqsut, the North Slope Borough (NSB), and the Arctic Slope Native Association (ASNA) and supported by recommendations from the Alaska OCS Region Offshore Advisory Committee (AOAC). The resource estimates forecast for Alternative IV.a range from 280 MMbbl at the $18-a-barrel level to 550 MMbbl at the $30-a-barrel level. This resource level is about 80 percent of the forecasted resources of Alternative I. Support and crude-oil transport infrastructure would be the same as that proposed for Alternative I. Please see Section IV.A.1 for additional information. Alternative IV.b analyzes the effect of a proposed special mitigating measure, Stipulation 6, Permanent Facility Siting in the Vicinity of Cross Island, in lieu of deferral.

E. ALTERNATIVE V - AREA OFFSHORE THE ANWR:

Alternative V is examined in this EIS as two options: option V.a analyzes the effects of deferring 122 blocks, approximately 36 percent of the sale area; option V.b analyzes the effects of special mitigation in lieu of deferral. Alternative V.a would result in the offering of 241 whole and partial blocks or 437,866 ha (1.6 million acres), approximately 64 percent of Alternative I (Fig. II.C-1). The resource estimates forecast for Alternative V.a range from 210 MMbbl at the $18-a-barrel level to 450 MMbbl at the $30-a-barrel level. This resource level is about 60 to 67 percent of the forecasted resources of Alternative I. Alternative V.a analyzes the deferral of an area offshore the Refuge extending from the Federal/State OCS boundary out to the seaward limit of the sale area, from the eastern limit of the sale area (extending to 12 mi west of the community of Kaktovik) westward to a point approximately 146° W longitude. The area that would be deferred under Alternative V.a includes 122 blocks covering 250.164 ha (618,167 acres). Alternative V.a includes all of the Kaktovik Deferral, Alternative III, analyzed in the Draft EIS and additional areas to the west and north of 146° W. longitude (The Kaktovik Deferral, Alternative III, would offer 278 blocks or 519,419 ha). Alternative V.b analyzes three proposed new stipulations

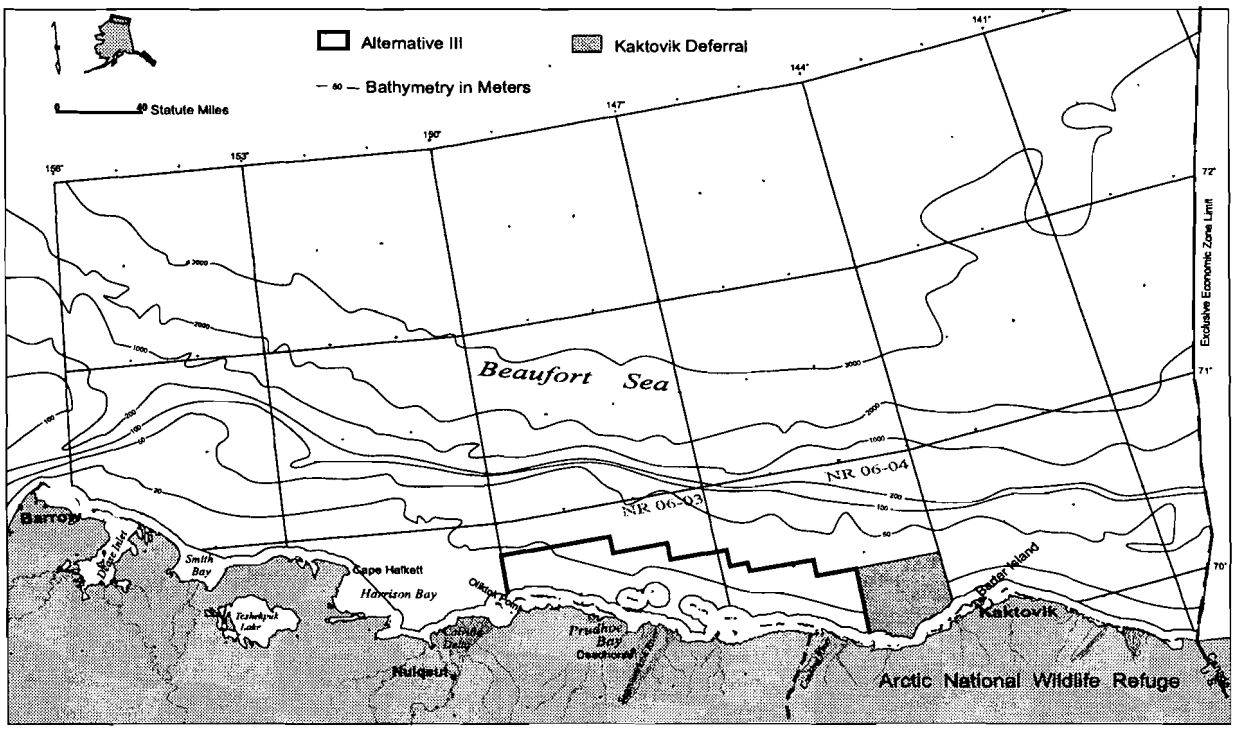


Figure II.C.1 Alternative III, Kaktovik Deferral

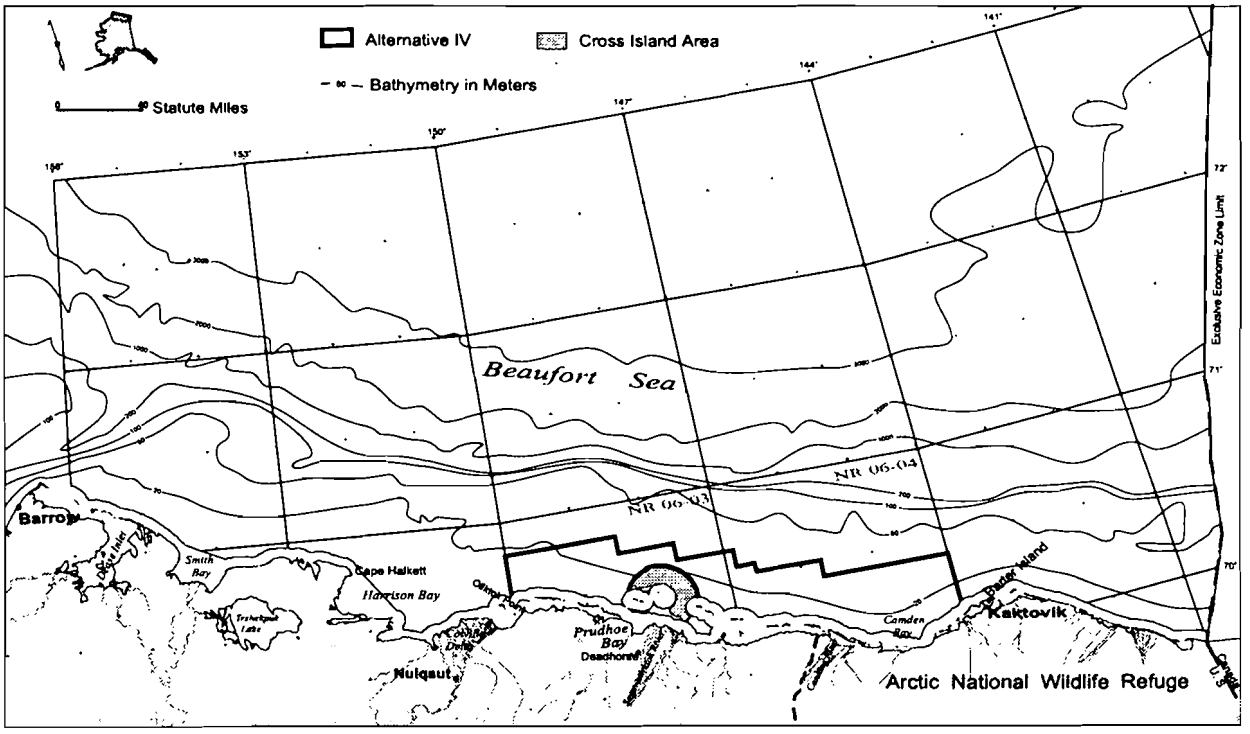


Figure II.D.1 Alternative IV, Cross Island Area

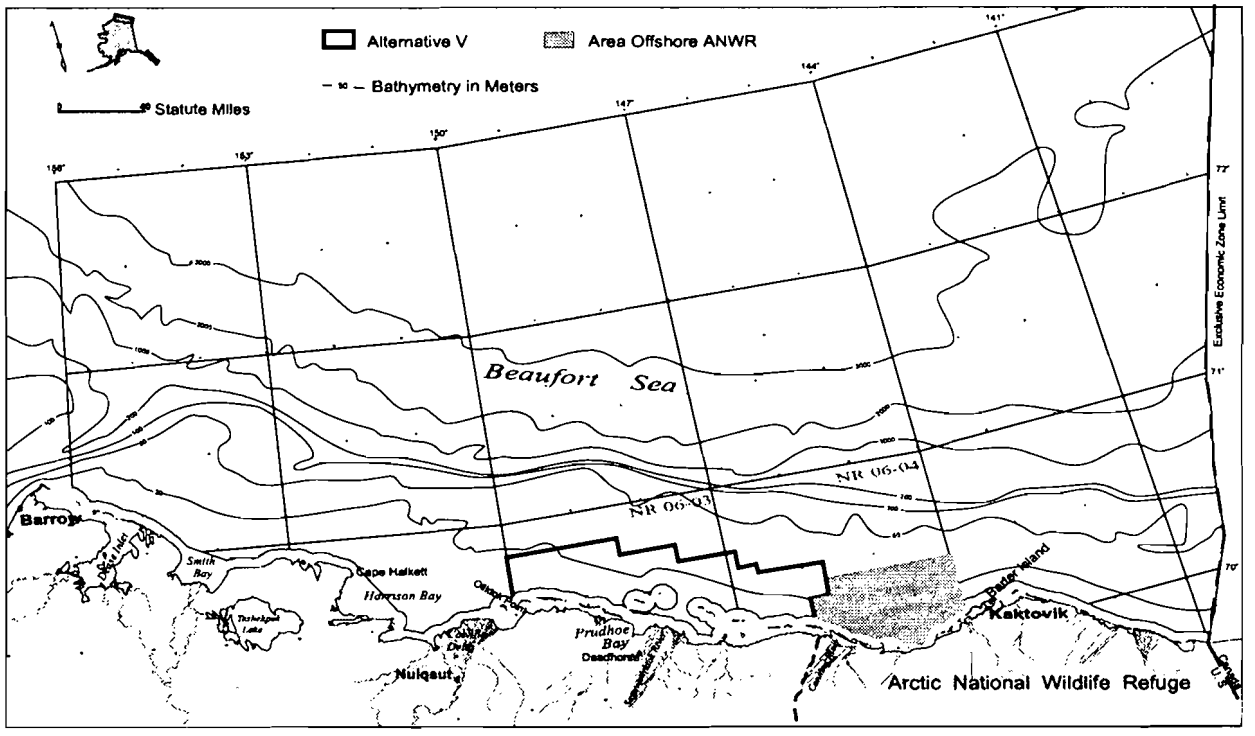


Figure II.E.1 Alternative V, Area Offshore the Arctic National Wildlife Refuge (ANWR)

and three ITL clauses developed for the area offshore the ANWR in lieu of deferral. Alternative V.b analyzes the effects of special mitigation measures developed for protection in lieu of deferral.

This alternative was requested by the AOAC; the City of Kaktovik; the NSB; the ASNA; several Canadian Native groups, including the Gwitchin Tribal Council, Teetl'it Gwich'in Council, the Ehditat Renewable Resource Council, Vuntut Gwitchin First Nation, and the Porcupine Caribou Management Board; environmental groups; and individuals. Alternative V activities would be supported from marine and air facilities located in and around Prudhoe Bay/Kuparuk. Produced crude would be transported to Valdez via the TAPS and then to the U.S. West Coast and possibly the Far East via tanker. A more detailed discussion of the transportation scenario for Alternative V is contained in Section IV.A.1.

F. MITIGATING MEASURES THAT ARE PART OF THE ALTERNATIVES: Laws and regulations that provide mitigation are considered part of the alternatives. Examples include the Outer Continental Shelf Lands Act (OCSLA), which grants broad authority to the Secretary of the Interior to control lease operations and, where appropriate, undertake environmental monitoring studies; the Consolidated Offshore Operating Regulations (which rescinded and replaced Alaska OCS Orders effective May 31, 1988); and the Fishermen's Contingency Fund. Incorporated by reference in Section I.C is OCS Report MMS 86-003, *Legal Mandates and Federal Regulatory Responsibilities* (Rathbun, 1986). This report details the laws and regulations under which the MMS OCS leasing program operates; the report also outlines permit requirements, engineering criteria, testing procedures, and information requirements. These requirements are developed and administered by the MMS. The mitigating effect of these measures has been factored into the environmental effects analyses.

In addition, the following mitigating measures (Stipulations and ITL's) also are considered as part of the alternatives. Accordingly, the mitigating effects of these measures also have been factored into the environmental effects analyses (Sec. IV). The environmental effects analyses in Section IV.B contain a discussion of the effectiveness of the mitigating measures described in this section where germane to a given resource topic. These measures were analyzed as part of the Proposal in Sale 144, expanded and modified during Section 19 consultation, and subsequently adopted.

1. Stipulations: Stipulations 1 through 5 are considered part of the alternatives. Special Stipulations 6 through 9 were developed to provide mitigation for two new alternatives (Alternatives IV and V) based on comments submitted on the Draft EIS.

No. 1, Protection of Biological Resources
No. 2, Orientation Program
No. 3, Transportation of Hydrocarbons
No. 4, Industry Site-Specific Bowhead Whale-Monitoring Program
No. 5, Conflict Avoidance Mechanisms to Protect Subsistence Whaling and Other Subsistence Activities

Special Mitigation Applicable to Alternative IV, Cross Island Area:
No. 6, Permanent Facility Siting in the Vicinity of Cross Island

Special Mitigation Applicable to Alternative V, Area Offshore the Arctic National Wildlife Refuge:
No. 7, Planning for Activities Offshore the Arctic National Wildlife Refuge
No. 8, OCS Pipelines Offshore the Arctic National Wildlife Refuge
No. 9, Protection of Polar Bears from Proposed Development Offshore the Arctic National Wildlife Refuge

Stipulation No. 1, Protection of Biological Resources. If biological populations or habitats that may require additional protection are identified in the lease area by the Regional Supervisor, Field Operations (RS/FO), the RS/FO may require the lessee to conduct biological surveys to determine the extent and composition of such biological populations or habitats. The RS/FO shall give written notification to the lessee of the RS/FO's decision to require such surveys.

Based on any surveys that the RS/FO may require of the lessee or on other information available to the RS/FO on special biological resources, the RS/FO may require the lessee to:
(1) Relocate the site of operations;
(2) Establish to the satisfaction of the RS/FO, on the basis of a site-specific survey, either that such operations will not have a significant adverse effect upon the resource identified or that a special biological resource does not exist;
(3) Operate during those periods of time, as established by the RS/FO, that do not adversely affect the biological resources; and/or
(4) Modify operations to ensure that significant biological populations or habitats deserving protection are not adversely affected.

If any area of biological significance should be discovered during the conduct of any operations on the lease, the lessee shall immediately report such findings to the RS/FO and make every reasonable effort to preserve and protect the biological resource from damage until the RS/FO has given the lessee direction with respect to its protection.

The lessee shall submit all data obtained in the course of biological surveys to the RS/FO with the locational information for drilling or other activity. The lessee may take no action that might affect the biological populations or habitats surveyed until the RS/FO provides written directions to the lessee with regard to permissible actions. The RS/FO will utilize the best available information as determined in consultation with the Arctic Biological Task Force.

Stipulation No. 2, Orientation Program. The lessee shall include in any exploration or development and production plans submitted under 30 CFR 250.33 and 250.34 a proposed orientation program for all personnel involved in exploration or development and production activities (including personnel of the lessee's agents, contractors, and subcontractors) for review and approval by the Regional Supervisor, Field Operations. The program shall be designed in sufficient detail to inform individuals working on the project of specific types of environmental, social, and cultural concerns that relate to the sale and adjacent areas. The program shall address the importance of not disturbing archaeological and biological resources and habitats, including endangered species, fisheries, bird colonies, and marine mammals and provide guidance on how to avoid disturbance. This guidance will include the production and distribution of information cards on endangered and/or threatened species in the sale area. The program shall be designed to increase the sensitivity and understanding of personnel to community values, customs, and lifestyles in areas in which such personnel will be operating. The orientation program shall also include information concerning avoidance of conflicts with subsistence, commercial fishing activities, and pertinent mitigation.

The program shall be attended at least once a year by all personnel involved in onsite exploration or development and production activities (including personnel of the lessee's agents, contractors, and subcontractors) and all supervisory and managerial personnel involved in lease activities of the lessee and its agents, contractors, and subcontractors.

The lessee shall maintain a record of all personnel who attend the program onsite for so long as the site is active, not to exceed 5 years. This record shall include the name and date(s) of attendance of each attendee.

Stipulation No. 3, Transportation of Hydrocarbons. Pipelines will be required: (a) if pipeline rights-of-way can be determined and obtained; (b) if laying such pipelines is technologically feasible and environmentally preferable; and (c) if, in the opinion of the lessor, pipelines can be laid without net social loss, taking into account any incremental costs of pipelines over alternative methods of transportation and any incremental benefits in the form of increased environmental protection or reduced multiple-use conflicts. The lessor specifically reserves the right to require that any pipeline used for transporting production to shore be placed in certain designated management areas. In selecting the means of transportation, consideration will be given to recommendations of any advisory groups and Federal, State, and local governments and industry.

Following the development of sufficient pipeline capacity, no crude oil production will be transported by surface vessel from offshore production sites, except in the case of an emergency. Determinations as to emergency conditions and appropriate responses to these conditions will be made by the Regional Supervisor, Field Operations.

Stipulation No. 4, Industry Site-Specific Bowhead Whale-Monitoring Program. Lessees proposing to conduct exploratory drilling operations, including seismic surveys, during the bowhead whale migration will be required to conduct a site-specific monitoring program approved by the Regional Supervisor, Field Operations (RS/FO); unless, based on the size, timing, duration, and scope of the proposed operations, the RS/FO, in consultation with the North Slope Borough (NSB) and the Alaska Eskimo Whaling Commission (AEWC), determine that a monitoring program is not necessary. The RS/FO will provide the NSB, AEWC, and the State of Alaska a minimum of 30 but no longer than 60 calendar days to review and comment on a proposed monitoring program prior to approval. The monitoring program must be approved each year before exploratory drilling operations can be commenced.

The monitoring program will be designed to assess when bowhead whales are present in the vicinity of lease operations and the extent of behavioral effects on bowhead whales due to these operations. In designing the program, lessees must consider the potential scope and extent of effects that the type of operation could have on bowhead whales. Experiences relayed by subsistence hunters indicate that, depending on the type of operations, some whales demonstrate avoidance behavior at distances of up to 35 mi. The program must also provide for the following:

(1) Recording and reporting information on sighting of other marine mammals and the extent of behavioral effects due to operations,
(2) Inviting an AEWC or NSB representative to participate in the monitoring program as an observer,
(3) Coordinating the monitoring logistics beforehand with the MMS Bowhead Whale Aerial Survey Project (BWASP),
(4) Submitting daily monitoring results to the MMS BWASP,
(5) Submitting a draft report on the results of the monitoring program to the RS/FO within 60 days following the completion of the operation. The RS/FO

will distribute this draft report to the AEWC, the NSB, the State of Alaska, and the National Marine Fisheries Service (NMFS).

(6) Submitting a final report on the results of the monitoring program to the RS/FO. The final report will include a discussion of the results of the peer review of the draft report. The RS/FO will distribute this report to the AEWC, the NSB, the State of Alaska, and the NMFS.

Lessees will be required to fund an independent peer review of a proposed monitoring plan and the draft report on the results of the monitoring program. This peer review will consist of independent reviewers who have knowledge and experience in statistics, monitoring marine mammal behavior, the type and extent of the proposed operations, and an awareness of traditional knowledge. The peer reviewers will be selected by the RS/FO from experts recommended by the NSB, the AEWC, industry, NMFS, and MMS. The results of these peer reviews will be provided to the RS/FO for consideration in final approval of the monitoring program and the final report, with copies to the NSB, AEWC, and the State of Alaska.

In the event the lessee is seeking a Letter of Authorization (LOA) or Incidental Harassment Authorization (IHA) for incidental take from the NMFS, the monitoring program and review process required under the LOA or IHA may satisfy the requirements of this stipulation. Lessees must advise the RS/FO when it is seeking an LOA or IHA in lieu of meeting the requirements of this stipulation and provide the RS/FO with copies of all pertinent submittals and resulting correspondence. The RS/FO will coordinate with the NMFS and advise the lessee if the LOA or IHA will meet these requirements.

This stipulation applies to the following blocks for the time periods listed and will remain in effect until termination or modification by the Department of the Interior, after consultation with the NMFS and the NSB.

Central Fall Migration Area: September 1 through October 31
OPD: NR 06-03, Beechey Point. Blocks included: 6202–6213, 6251–6263, 6301–6319, 6351–6369, 6401–6424, 6456–6474, 6509–6524, 6568–6574, 6618–6624, 6671–6674, 6723–6724, 6773
OPD: NR 06-04, Flaxman Island. Blocks included: 6401, 6451, 6501–6503, 6551–6559, 6601–6609, 6651–6659, 6701–6709, 6751–6759, 6802–6809, 6856–6859

Eastern Fall Migration: August 1 through October 31
OPD: NR 06-04, Flaxman Island. Blocks included: 6560, 6610, 6660–6674, 6710–6724, 6760–6774, 6810–6824, 6860–6874, 6910–6924, 6961–6974, 7013–7022, 7066–7070, 7118–7119.

Stipulation No. 5, Conflict Avoidance Mechanisms to Protect Subsistence Whaling and Other Subsistence Activities. Exploration and development and production operations shall be conducted in a manner that prevents unreasonable conflicts between the oil and gas industry and subsistence activities (including, but not limited to, bowhead whale subsistence hunting).

Prior to submitting an exploration plan or development and production plan (including associated oil-spill contingency plans) to the MMS for activities proposed during the bowhead whale migration period, the lessee shall consult with the potentially affected subsistence communities, Barrow, Kaktovik, or Nuiqsut, the North Slope Borough (NSB), and the Alaska Eskimo Whaling Commission (AEWC) to discuss potential conflicts with the siting, timing, and methods of proposed operations and safeguards or mitigating measures which could be implemented by the operator to prevent unreasonable conflicts. Through this consultation, the lessee shall make every reasonable effort, including such mechanisms as a conflict avoidance agreement, to assure that exploration, development, and production activities are compatible with whaling and other subsistence hunting activities and will not result in unreasonable interference with subsistence harvests.

A discussion of resolutions reached during this consultation process and plans for continued consultation shall be included in the exploration plan or the development and production plan. In particular, the lessee shall show in the plan how its activities, in combination with other activities in the area, will be scheduled and located to prevent unreasonable conflicts with subsistence activities. Lessees shall also include a discussion of multiple or simultaneous operations, such as ice management and seismic activities, that can be expected to occur during operations in order to more accurately assess the potential for any cumulative affects. Communities, individuals, and other entities who were involved in the consultation shall be identified in the plan. The Regional Supervisor/Field Operations (RS/FO) shall send a copy of the exploration plan or development and production plan (including associated oil-spill contingency plans) to the potentially affected communities, and the AEWC at the time they are submitted to the MMS to allow concurrent review and comment as part of the plan approval process.

In the event no agreement is reached between the parties, the lessee, the AEWC, the NSB, the National Marine Fisheries Service (NMFS), or any of the subsistence communities that could potentially be affected by the proposed activity may request that the RS/FO assemble a group consisting of representatives from the subsistence communities, AEWC, NSB, NMFS, and the lessee(s) to specifically address the conflict and attempt to resolve the issues before making a final determination on the adequacy of the measures taken to prevent unreasonable conflicts

with subsistence harvests. Upon request, the RS/FO will assemble this group before making a final determination on the adequacy of the measures taken to prevent unreasonable conflicts with subsistence harvests.

The lessee shall notify the RS/FO of all concerns expressed by subsistence hunters during operations and of steps taken to address such concerns. Lease-related use will be restricted when the RS/FO determines it is necessary to prevent unreasonable conflicts with local subsistence hunting activities.

In enforcing this stipulation, the RS/FO will work with other agencies and the public to assure that potential conflicts are identified and efforts are taken to avoid these conflicts, (for example, timing operations to avoid the bowhead whale subsistence hunt). These efforts might include seasonal drilling restrictions, seismic and threshold depth restrictions, and requirements for directional drilling and the use of other technologies deemed appropriate by the RS/FO.

Subsistence whaling activities occur generally during the following periods:

August to October: Kaktovik whalers use the area circumscribed from Anderson Point in Camden Bay to a point 30 kilometers north of Barter Island to Humphrey Point east of Barter Island. Nuiqsut whalers use an area extending from a line northward of the Nechelik Channel of the Colville River to Flaxman Island, seaward of the Barrier Islands.

September to October: Barrow hunters use the area circumscribed by a western boundary extending approximately 15 kilometers west of Barrow, a northern boundary 50 kilometers north of Barrow, then southeastward to a point about 50 kilometers off Cooper Island, with an eastern boundary on the east side of Dease Inlet. Occasional use may extend eastward as far as Cape Halkett.

Stipulation No. 6, Permanent Facility Siting in the Vicinity of Cross Island. This stipulation applies to all or a portion of the blocks listed in Table II.F.1-1.

Permanent OCS production facility siting within a defined 10-mile radius around Cross Island will be prohibited unless the lessee demonstrates to the satisfaction of the Regional Director, in consultation with the North Slope Borough and the Alaska Eskimo Whaling Commission, that the development will not preclude reasonable subsistence access to whales. In making such a demonstration, the lessee shall follow the processes and requirements for consultation and mitigation of unreasonable conflicts as set out in Stipulation No. 5.

Stipulation No. 7, Planning for Activities Offshore the Arctic National Wildlife Refuge. This stipulation applies to the following blocks in the eastern Beaufort Sea offshore the ANWR: *Official Protraction Diagram NR 06-04, Flaxman Island*, Blocks 6661 through 6674; 6711 through 6724; 6759 through 6774; 6809 through 6824; 6859 through 6874; 6910 through 6924; 6961 through 6974; 7013 through 7022; 7066 through 7070; and 7118 through 7119.

Exploration and development and production plans must contain a description of proposed equipment staging areas, infrastructure, and other related activities. In particular, lessees shall demonstrate the ability to stage and mobilize equipment, including oil spill response equipment, from locations other than the ANWR which meet the regulatory requirements at 30 CFR 250.33 and 34.

Stipulation No. 8, OCS Pipelines Offshore the Arctic National Wildlife Refuge. This stipulation applies to the following blocks in the eastern Beaufort Sea offshore the ANWR: *Official Protraction Diagram NR 06-04, Flaxman Island*, Blocks 6661 through 6674; 6711 through 6724; 6759 through 6774; 6809 through 6824; 6859 through 6874; 6910 through 6924; 6961 through 6974; 7013 through 7022; 7066 through 7070; and 7118 through 7119.

Production from an OCS facility offshore the ANWR will not be allowed until a subsea pipeline has been constructed in other offshore areas of the Beaufort Sea or areas with similar Arctic conditions. Any proposal to construct a

Table II.F.1-1 Area Covered by Stipulation 6

Stipulation 6 applies to all or a portion of the following blocks. Blocks are from Official Protraction Diagram NR 06-03, Beechey Point.

Block No.	Hectares Covered	Block No.	Hectares Covered
6415A	519.273275	6566B,E	212.347432
6416A	1,595.953853	6568B	384.348133
6417A	1,921.899397	6569A,B	2,304.000000
6418A	1,565.382078	6570A,B	2,304.000000
6419A	479.080012	6571A,C	202.171637
6464B, D, F	639.202888	6616B,H,I	351.262520
6465A, B	2,263.586966	6618B,C,E	380.046799
6466A,B	2,304.000000	6619A,B,C	2,304.000000
6467A,B	2,304.000000	6620B,D	1,796.449026
6468A,B	2,304.000000	6621B	141.076473
6469A, B	2,242.000673	6664C,H,I	253.292269
6470A	549.839495	6665C,G,H,I,K	411.303748
6514B,D,E,F,H	997.781496	6666D,G,H,J	1,597.217218
6515B,C,D,E	2,022.004162	6667C,D,G	978.470607
6516B,C,F	1,789.113508	6668B,C,E,F	1,803.648824
6517B,D	880.644747	6669B,D,F	1,762.603314
6518B	1,845.320650	6670B	2.021057
6519A,B	2,304.000000	6717B	159.939645
6520A	1,890.926145	6718B,C,E,F,G	1,735.297239
6521A	.163748	6719B	1,591.364023
6565B	111.337988	6768B	16.092849
		6769I,J	31.340348

pipeline must address the methods for construction, maintenance, monitoring and repair of the pipeline under limiting seasonal conditions and restricted access from the ANWR.

Stipulation No. 9, Protection of Polar Bears From Proposed Development Offshore the Arctic National Wildlife Refuge. This stipulation applies to the following blocks in the eastern Beaufort Sea offshore the ANWR: *Official Protraction Diagram NR 06-04, Flaxman Island,* Blocks 6661 through 6674; 6711 through 6724; 6759 through 6774; 6809 through 6824; 6859 through 6874; 6910 through 6924; 6961 through 6974; 7013 through 7022; 7066 through 7070; and 7118 through 7119.

Important polar bear denning and habitat areas are located offshore the Arctic National Wildlife Refuge. In preparing environmental information in association with a proposed development and production plan (DPP) pursuant to 30 CFR 250.34, the lessee(s) must provide data and information on polar bear distribution, denning, and habitat, and potential effects from development activities, including oil spills. As part of the DPP, lessees must provide information on measures to be taken to minimize effects to polar bears. In accordance with 30 CFR 250.34(s), the MMS, in consultation with the USFWS, may require lessees to conduct project-specific surveys related to polar bears.

2. Information to Lessees: The ITL's 1 through 21 apply to OCS activities in the Beaufort Sea and are considered part of the alternatives for Sale 170. The ITL's 22 and 23 were developed during the final EIS process as special mitigation for the area offshore the ANWR.

No. 1, Information on Community Participation in Operations Planning
No. 2, Information on Kaktovikmiut Guide *In This Place*
No. 3, Information on Nuiqsutmiut Paper
No. 4, Information on the Arctic Biological Task Force
No. 5, Information on Bird and Marine Mammal Protection
No. 6, Information on River Deltas
No. 7, Information on Endangered Whales and MMS Monitoring Program
No. 8, Information on the Availability of Bowhead Whales for Subsistence-Hunting Activities
No. 9, Information on Geological and Geophysical Survey Activity
No. 10, Information on Polar Bear Interaction
No. 11, Information on the Spectacled Eider and Steller's Eider
No. 12, Information on Sensitive Areas to be Considered in Oil-Spill-Contingency Plans
No. 13, Information on Oil-Spill-Cleanup Capability
No. 14, Information on Oil-Spill-Response Preparedness
No. 15, Information on Certification of Oil Spill Financial Responsibility
No. 16, Information on Coastal Zone Management
No. 17, Information on Navigational Safety
No. 18, Information on Offshore Pipelines
No. 19, Information on Discharge of Produced Waters
No. 20, Information on Use of Existing Pads and Islands
No. 21, Information on Affirmative Action Requirements

Special Mitigation Applicable to Alternative V, Area Offshore the Arctic National Wildlife Refuge:
No. 22, Information on Activities on the Arctic National Wildlife Refuge
No. 23, Information on Consultation on Activities Offshore the Arctic National Wildlife Refuge

No. 1, Information on Community Participation in Operations Planning. Lessees are encouraged to bring one or more residents of communities in the area of operations into their planning process. Local communities often have the best understanding of how oil and gas activities can be conducted safely in and around their area without harming the environment or interfering with community activities. Involving local community residents in the earliest stages of the planning process for proposed oil and gas activities can be beneficial to the industry and the community. Community representation on management teams developing plans of operation, oil spill contingency plans, and other permit applications can help communities understand permitting obligations and help the industry to understand community values and expectations for oil and gas operations being conducted in and around their area.

No. 2, Information on Kaktovikmiut Guide - "In This Place." The people of Kaktovik, the Kaktovikmiut, have compiled "A Guide for Those Wishing to Work in The Country of the Kaktovikmiut." The guide's intent, in part, is to provide information that may promote a better understanding of their concerns. Lessees are encouraged to obtain copies of the guide and to incorporate it into their Orientation Program to assist in fostering sensitivity and understanding of personnel to community values, customs, and lifestyles in areas in which they will be operating.

No. 3, Information on Nuiqsutmiut Paper. The people of Nuiqsut, the Nuiqsutmiut, have compiled a paper for people working in their country. The paper provides information that may promote a better understanding of their concerns. Lessees are encouraged to obtain copies of the paper and to incorporate it into their Orientation Program to assist in fostering sensitivity and understanding of personnel to community values, customs, and lifestyles in areas in which they will be operating.

No. 4, Information on the Arctic Biological Task Force. Lessees are advised that in the enforcement of the

Protection of Biological Resources stipulation, the Regional Supervisor, Field Operations (RS/FO), will consider recommendations from the Arctic Biological Task Force (BTF) composed of designated representatives of the MMS, Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), and Environmental Protection Agency (EPA). Personnel from the State of Alaska and local communities are invited and encouraged to participate in the proceedings of the BTF. The RS/FO will consult with the Arctic BTF on the conduct of biological surveys by lessees and the appropriate course of action after surveys have been conducted.

No. 5, Information on Bird and Marine Mammal Protection. Lessees are advised that during the conduct of all activities related to leases issued as a result of this sale, the lessee and its agents, contractors, and subcontractors will be subject to the provisions of the Marine Mammal Protection Act (MMPA) of 1972, as amended (16 U.S.C. 1361 et seq.); the Endangered Species Act (ESA), as amended (16 U.S.C. 1531 et seq.); and applicable International Treaties.

Lessees and their contractors should be aware that disturbance of wildlife could be determined to constitute harm or harassment and thereby be in violation of existing laws and treaties. With respect to endangered species and marine mammals, disturbance could be determined to constitute a "taking" situation. Under the ESA, the term "take" is defined to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Under the MMPA, "take" means "harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill any marine mammal." These Acts and applicable Treaties require violations be reported to the NMFS or the FWS, as appropriate.

Incidental taking of marine mammals and endangered and threatened species is allowed only when the statutory requirements of the MMPA and/or the ESA are met. Section 101(a)(5) of the MMPA (16 U.S.C. 1371(a)(5)) allows for the taking of small numbers of marine mammals incidental to a specified activity within a specified geographical area. Section 7(b)(4) of the ESA (16 U.S.C. 1536(b)(4)) allows for the incidental taking of endangered and threatened species under certain circumstances. If a marine mammal species is listed as endangered or threatened under the ESA, the requirements of both the MMPA and the ESA must be met before the incidental take can be allowed.

Under the MMPA and ESA, the NMFS is responsible for species of the order Cetacea (whales and dolphins) and the suborder Pinnipedia (seals and sea lions) except walrus; the FWS is responsible for polar bears, sea otters, walrus, and birds. Procedural regulations implementing the provisions of the MMPA are found at 50 CFR Part 18.27 for FWS, and at 50 CFR Part 228 for NMFS.

Lessees are advised that a Letter of Authorization (LOA) or Incidental Harassment Authorization (IHA) must be obtained by those proposing the activity to allow the incidental take of marine mammals whether or not they are endangered or threatened.

Of particular concern is disturbance at major wildlife concentration areas, including bird colonies, marine mammal haulout and breeding areas, and wildlife refuges and parks. Maps depicting major wildlife concentration areas in the lease area are available from the RS/FO. Lessees are also encouraged to confer with the FWS and NMFS in planning transportation routes between support bases and lease holdings.

Lessees should exercise particular caution when operating in the vicinity of species whose populations are known or thought to be declining and which are not protected under the ESA, such as Pacific walrus. The FWS issued incidental take regulations for walruses in the Beaufort Sea and adjacent northern coast of Alaska that were in effect for an 18-month period beginning December 16, 1993 (50 CFR 18.121 et seq.). These regulations have been extended until December 15, 1998. Incidental take regulations are promulgated only upon request and the FWS must be in receipt of a petition prior to initiating the regulatory process. Incidental, but not intentional, taking is authorized only by U.S. citizens holding an LOA issued pursuant to these regulations. An LOA or IHA must be requested annually.

Behavioral disturbance of most birds and mammals found in or near the lease area would be unlikely if aircraft and vessels maintain at least a 1-mile horizontal distance and aircraft maintain at least a 1,500-foot vertical distance above known or observed wildlife concentration areas, such as bird colonies and marine mammal haulout and breeding areas.

For the protection of endangered whales and marine mammals throughout the lease area, it is recommended that all aircraft operators maintain a minimum 1,500-foot altitude when in transit between support bases and exploration sites. Lessees and their contractors are encouraged to minimize or reroute trips to and from the leasehold by aircraft and vessels when endangered whales are likely to be in the area.

Human safety should take precedence at all times over these recommendations.

No. 6, Information on River Deltas. Lessees are advised that certain river deltas of the Beaufort Sea coastal plain (such as the Kongakut, Canning, and Colville) have been

identified by the FWS as special habitats for bird nesting and fish overwintering areas, as well as other forms of wildlife. Shore-based facilities in these river deltas may be prohibited by the permitting agency.

No. 7, Information on Endangered Whales and MMS Monitoring Program. Lessees are advised that the MMS intends to continue its area wide endangered bowhead whale monitoring program in the Beaufort Sea during exploration activities. The program will gather information on whale distribution patterns which will be used by MMS and others to assess impacts on bowhead whales.

The MMS will perform an environmental review for each proposed exploration plan and development and production plan, including an assessment of cumulative effects of noise on endangered whales. Should the review conclude that activities described in the plan will be a threat of serious, irreparable, or immediate harm to the species, the RS/FO will require that activities be modified, or otherwise mitigated before such activities would be approved.

Lessees are further advised that the RS/FO has the authority and intends to limit or suspend any operations, including preliminary activities, as defined under 30 CFR 250.3l, on a lease whenever bowhead whales are subject to a threat of serious, irreparable, or immediate harm to the species. Should the information obtained from MMS or lessees' monitoring programs indicate that there is a threat of serious, irreparable, or immediate harm to the species, the RS/FO will require the lessee to suspend operations causing such effects, in accordance with 30 CFR 250.10. Any such suspensions may be terminated when the RS/FO determines that circumstances which justified the ordering of suspension no longer exist. Notice to Lessees No. 86-2 specifies performance standards for preliminary activities.

Incidental taking of marine mammals and endangered and threatened species is allowed only when the statutory requirements of the MMPA and/or the ESA are met. Section 101(a)(5) of the MMPA (16 U.S.C. 1371(a)(5)) allows for the taking of small numbers of marine mammals incidental to a specified activity within a specified geographical area. Section 7(b)(4) of the ESA (16 U.S.C. 1536(b)(4)) allows for the incidental taking of endangered and threatened species under certain circumstances. If a marine mammal species is listed as endangered or threatened under the ESA, the requirements of both the MMPA and the ESA must be met before the incidental take can be allowed.

Information regarding endangered whales will be reviewed periodically by the MMS in consultation with the NMFS, the State of Alaska, the North Slope Borough (NSB), and the Alaska Eskimo Whaling Commission (AEWC). The sources of information include: the MMS monitoring program; the industry site-specific monitoring program; pertinent results of the MMS environmental studies; observations of subsistence hunters utilizing the area and other applicable information. The purpose of the review will be to determine whether existing mitigating measures adequately protect the endangered whales. Should the review indicate the threat of serious, irreparable, or immediate harm to the species, the MMS will take action to protect the species, including the possible imposition of a seasonal drilling restriction, or other restrictions if appropriate.

No. 8, Information on the Availability of Bowhead Whales for Subsistence-Hunting Activities. Lessees are advised that the NMFS issues regulations for incidental take of marine mammals, including bowhead whales. Incidental take regulations are promulgated only upon request and the NMFS must be in receipt of a petition prior to initiating the regulatory process. Incidental takes of bowhead whales are allowed only if an LOA or an IHA is obtained from the NMFS pursuant to the regulations in effect at the time. An LOA or an IHA must be requested annually. In issuing an LOA or an IHA, the NMFS must determine that proposed activities will not have an unmitigable adverse effect on the availability of the bowhead whale to meet subsistence needs by causing whales to abandon or avoid hunting areas, directly displacing subsistence users, or placing physical barriers between whales and subsistence users.

Lessees are also advised that, in reviewing proposed exploration plans which propose activities during the bowhead whale migration, the MMS will conduct an environmental review of the potential effects of the activities, including cumulative effects of multiple or simultaneous operations, on the availability of the bowhead whale for subsistence use. The MMS may limit or require operations be modified if they could result in significant effects on the availability of the bowhead whale for subsistence use.

The MMS and the NMFS will establish procedures to coordinate results from site-specific surveys required by Sale 170 Stipulation No. 4 and NMFS LOA's or IHA's to determine if further modification to lease operations are necessary.

No. 9, Information on Geological and Geophysical Survey Activity. Lessees are advised of the potential effect of geological and geophysical (G&G) activity to bowhead whales and subsistence hunting activities. High resolution G&G surveys are distinguished from 2-D and 3-D geophysical surveys by the magnitude of the energy source used in the survey, the size of the survey area, the number and length of arrays used, and duration of the survey period. High resolution G&G surveys are typically conducted after a lease sale in association with a specific exploration or development program or in anticipation of

future lease sale activity. The 2-D and 3-D geophysical surveys are typically conducted prior to lease sales.

Lessees are advised that all G&G survey activity conducted in the Beaufort Sea Planning Area, either under the pre-lease permitting regulations at 30 CFR 251, or as part of an approved exploration or development and production plan at 30 CFR 250, is subject to environmental and regulatory review by the MMS. It is the intention of MMS to treat pre-lease G&G activities in a manner similar to the post-lease G&G activities. The MMS has standard mitigating measures which are applied to these activities, and lessees are encouraged to review these measures before developing their applications for G&G permits. Copies of the non-proprietary portions of all G&G permit applications will be provided by MMS to the NSB, the AEWC, and potentially affected subsistence communities for comment. The MMS may impose restrictions (including the timing of operations relative to open water) and other requirements (such as having a locally approved coordinator on board) on G&G surveys to minimize unreasonable conflicts between the G&G survey and subsistence whaling activities.

Lessees and applicants are advised that MMS will require any proposed G&G activity to be coordinated with potentially affected subsistence communities, the NSB, and the AEWC to identify potential conflicts and develop plans to avoid these conflicts. Copies of the results of any required monitoring plans will be provided by MMS to the potentially affected subsistence communities, the NSB, and the AEWC for comment. In the event of no agreement, a similar conflict resolution process as described in Stipulation No. 5, Conflict Avoidance Mechanisms to Protect Subsistence Whaling and Other Subsistence Activities, will be implemented.

No. 10, Information on Polar Bear Interaction. Lessees are advised that polar bears may be present in the area of operations, particularly during the solid-ice period. Lessees should conduct their activities in a manner which will limit potential encounters and interaction between lease operations and polar bears. The FWS is responsible for the protection of polar bears under the provisions of the MMPA of 1972, as amended. Lessees are advised to contact the FWS regarding proposed operations and actions that might be taken to minimize interactions with polar bears. Lessees also are advised to consult "OCS Study MMS 93-0008, Guidelines for Oil and Gas Operations in Polar Bear Habitats."

Lessees are advised that the FWS issued final regulations for incidental take of polar bears in the Beaufort Sea and adjacent northern coast of Alaska effective December 16, 1993 (50 CFR 18.111, et seq.). These regulations were in effect for an 18-month period and have been extended for an additional 40 months through December 15, 1998. The FWS must be in receipt of a petition for incidental take prior to initiating the regulatory process. Incidental takes of polar bears are allowed only if an LOA or an IHA is obtained from the FWS pursuant to the regulations in effect at the time. An LOA or an IHA must be requested annually.

Lessees are reminded of the provisions of the 30 CFR 250.40 regulations which prohibit discharges of pollutants into offshore waters. Trash, waste, or other debris which might attract polar bears or be harmful to polar bears should be properly stored and disposed of to minimize attraction of, or encounters with, polar bears.

No. 11, Information on the Spectacled Eider and Steller's Eider. Lessees are advised that the spectacled eider (*Somateria fischeri*) and Steller's eider (Polysticta stelleri) are listed as threatened by the FWS and are protected by the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

Spectacled eiders and Steller's eiders are present in the Chukchi and Beaufort seas during spring migration in May and June. Males return to the open sea in late June, while nesting females remain on the arctic coastal tundra until late August or early September. Onshore activities related to OCS exploration, development, and production during the summer months (May-September) may affect nesting spectacled eiders and Steller's eiders.

Lessees are advised that exploration and development and production plans submitted to MMS will be reviewed by the FWS to ensure spectacled eider's, Steller's eiders, and their habitats are protected.

No. 12, Information on Sensitive Areas To Be Considered in the Oil-Spill Contingency Plans (OSCP). Lessees are advised that certain areas are especially valuable for their concentrations of marine birds, marine mammals, fishes, other biological resources, or cultural resources, and for their importance to subsistence harvest activities, and should be considered when developing OSCP's. Identified areas and time periods of special biological and cultural sensitivity include:

(1) the lead system off Point Barrow, April-June;
(2) the salt marshes from Kogru Inlet to Smith Bay, June-September;
(3) the Plover Islands, June-September;
(4) the Boulder Patch in Stefansson Sound, June-October;
(5) the Camden Bay area (especially the Nuvugag and Kaninniivik hunting sites), January, April-September, November;
(6) the Canning River Delta, January-December;
(7) the Barter Island - Demarcation Point Area, January-December;
(8) the Colville River Delta, January-December;

(9) the Cross, Pole, Egg, and Thetis Islands, June-September;
(10) the Flaxman Island waterfowl use and polar bear denning areas, January-December; (Leffingwell Cabin, a National Historic Site, is located on Flaxman Island);
(11) the Jones Island Group (Pingok, Spy, and Leavitt Islands) and Pole Island are known polar bear denning areas, November-April; and
(12) the Sagavanirktok River delta.

These areas are among areas of special biological and cultural sensitivity to be considered in the OSCP required by 30 CFR 250.42. Lessees are advised that they have the primary responsibility for identifying these areas in their OSCP's and for providing specific protective measures. Additional areas of special biological and cultural sensitivity may be identified during review of exploration plans and development and production plans.

Industry should consult with FWS or State of Alaska personnel to identify specific environmentally sensitive areas within National Wildlife Refuges or State special areas which should be considered when developing a project-specific OSCP.

Consideration should be given in an OSCP as to whether use of dispersants is an appropriate defense in the vicinity of an area of special biological and cultural sensitivity. Lessees are advised that prior approval must be obtained before dispersants are used.

No. 13, Information on Oil-Spill-Cleanup Capability. Exploratory drilling, testing, and other downhole activities will be prohibited in broken-ice conditions unless the lessee demonstrates to the RS/FO, the capability to detect, contain, clean up, and dispose of spilled oil in broken ice. For production operations, spill response plans must include a thorough evaluation of the burnability and emulsification characteristics of the field's crude oil under Arctic open-water and broken-ice conditions. The adequacy of these plans will be determined by the RS/FO with full consideration of the comments and recommendations received through the public review process. Lessees may be required to conduct additional field tests to verify response capabilities in broken-ice conditions.

No. 14, Information on Oil-Spill-Response Preparedness. Lessees are advised that they must be prepared to respond to oil spills which could occur as a result of offshore oil and gas exploration and development activities. With or prior to submitting a plan of exploration or a development and production plan, the lessee will submit for approval an OSCP in accordance with 30 CFR 250.42 and 30 CFR 254. Of particular concern are sections of the OSCP which address potential spill size and trajectory, specific actions to be taken in the event of a spill, the location and appropriateness of oil-spill equipment, and the ability of the lessee to protect communities and important resources from adverse effects of a spill. In the event local communities could be immediately affected by a spill, lessees are encouraged to stage response equipment within those communities and to utilize community resources in their response effort. In addition, lessees will be required to conduct spill response drills which include deployment of equipment to demonstrate response preparedness for spills under realistic conditions. Guidelines for oil-spill-contingency planning and response drills which supplement 30 CFR 250.43 and 30 CFR 254 have been developed and are available from the RS/FO.

No. 15, Certification of Oil Spill Financial Responsibility. This ITL applies to all blocks in Sale 170. The last paragraph of the ITL applies only to blocks offshore the ANWR.

Lessees are advised that Section 1016(c)(1) of the Oil Pollution Act (OPA) of 1990 (33 U.S.C. 2716(c)(1), as amended, requires that lessees establish and maintain evidence of oil spill financial responsibility. The authority to administer this provision was transferred from the U.S. Coast Guard to the MMS on October 18, 1991. On April 16, 1993, MMS issued a Notice to Lessees and Operators, No. 93-1N, that established interim guidelines for certification of oil spill financial responsibility and continued the implementing regulation 33 CFR 135 until such time as new regulations could be prepared. The interim guidelines retained the $35 million amount for oil spill financial responsibility for oil exploration, production, and transportation facilities on the OCS.

On March 25, 1997, the MMS published a Notice of Proposed Rulemaking in the *Federal Register* (62 *FR* 14052) for a new implementing regulation, 30 CFR 253. The proposed implementing regulation incorporates an amount for oil spill financial responsibility for oil exploration, production, and transportation facilities on the OCS that can vary between a minimum of $35 million and a maximum of $150 million, depending upon potential clean-up and damages costs, including environmental considerations. The proposed regulation also describes the criteria and basis for establishing the amount of oil spill financial responsibility required to be evidenced and the acceptable evidencing methods.

Following publication of a Final Rule, the MMS will consult with the FWS and other affected parties, to develop the basis for the amounts required to be evidenced for oil exploration, production, and transportation facilities on the OCS near the Arctic National Wildlife Refuge.

No. 16, Information on Coastal Zone Management. The State of Alaska will review OCS plans and associated

OSCP's through the review process for consistency with the Alaska Coastal Management Program (ACMP). The ACMP includes statewide standards found in 6 AAC 80 and enforceable policies found within approved coastal district programs. Contingency plans will be reviewed for compliance with state standards, the use of best available and safest technologies, and with state and regional contingency plans on a case-by-case basis.

No. 17, Information on Navigational Safety. Operations on some of the blocks offered for lease may be restricted by designation of fairways, precautionary zones, anchorages, safety zones, or traffic separation schemes established by the USCG pursuant to the Ports and Waterways Safety Act (33 U.S.C. 1221 et seq.), as amended. Lessees are encouraged to contact the USCG regarding any identified restrictions. The U.S. Corps of Engineers permits are required for construction of any artificial islands, installations, and other devices permanently or temporarily attached to the seabed located on the OCS in accordance with Section 4(e) of the OCSLA, as amended.

For additional information, prospective bidders should contact the U.S. Coast Guard, 17th Coast Guard District, P.O. Box 3-5000, Juneau, Alaska 99802, (907) 586-7355. For Corps of Engineers information, prospective bidders should contact U.S. Corps of Engineers, Alaska District, Regulatory Branch (1145b), P.O. Box 898, Anchorage, Alaska 99506-0898, (907) 753-2724.

No. 18, Information on Offshore Pipelines. Lessees are advised that the Department of the Interior and the Department of Transportation have entered into a Memorandum of Understanding, dated December 10, 1996, concerning the design, installation, and maintenance of offshore pipelines. Bidders should consult both departments for regulations applicable to offshore pipelines.

No. 19, Information on Discharge of Produced Waters. Lessees are advised that the State of Alaska prohibits discharges of produced waters on State tracts within the ten-meter depth contour. Discharges of produced waters into marine waters are subject to conditions of National Pollutant Discharge Elimination System permits issued by the EPA, and may also include a zero-discharge requirement on Federal tracts within the ten-meter contour.

No. 20, Information on Use of Existing Pads and Islands. During the review and approval process for exploration and development and production plans, MMS will encourage lessees to use existing pads and islands wherever feasible.

No. 21, Information on Affirmative Action Requirements. Revision of Department of Labor regulations on affirmative action requirements for Government contractors (including lessees) has been deferred, pending review of those regulations (see *Federal Register* of August 25, 1981, at 46 FR 42865 and 42968). Should changes become effective at any time before the issuance of leases resulting from this sale, section 18 of the lease form (Form MMS-2005, March 1986) would be deleted from leases resulting from this sale. In addition, existing stocks of the affirmative action forms contain language that would be superseded by revised regulations at 41 CFR 60-1.5(a)(1) and 60-1.7(a)(1). Submission of Form MMS-2032 (June 1985) and Form MMS-2033 (June 1985) will not invalidate an otherwise acceptable bid, and the requirements of the revised regulations will be deemed to be part of the existing affirmative action forms.

No. 22, Information on Activities on the Arctic National Wildlife Refuge. Lessees are advised that the Arctic National Wildlife Refuge (ANWR) is under the management of the U.S. Fish & Wildlife Service (FWS). No activities may be conducted within the ANWR without the permission of the FWS. The ANWR Comprehensive Conservation Plan, adopted pursuant to the Alaska National Interest Lands Conservation Act, section 304 (g) of Public Law 96-487, sets forth the management plan for the ANWR and specifies the policies and procedures applicable to the refuge.

No. 23, Information on Consultation on Activities Offshore the ANWR. Lessees are advised that the MMS will consult with the FWS regarding any OCS pipelines proposed to be constructed offshore the Arctic National Wildlife Refuge (ANWR) in formulating any special terms or measures necessary to protect the ANWR. The MMS will keep the FWS informed on the results of all monitoring and inspection of OCS pipelines as related to oil spill risk.

G. COMPARISON OF THE EFFECTS OF THE ALTERNATIVES AND THE CUMULATIVE CASE:

This section contains a comparative presentation and discussion of the environmental effects of Alternative I with that of the Kaktovik Deferral (Alternative III), the Cross Island Area (Alternative IV) and the Area Offshore the ANWR (Alternative V). The comparative discussion is based on the conclusions reached for each resource topic. Following the comparisons of the alternatives is the cumulative-case-effects conclusion. The reader can, at a glance, evaluate the estimated effects of the alternatives against those of the cumulative case. Not included in this analysis is Alternative II (the no-sale alternative). The no-sale alternative represents no action and no direct effects on area resources and, accordingly, is not evaluated; however, there could be effects related to alternative energy sources, as discussed in Section IV.C. The reader will note that the conclusions for Alternatives IV and V are divided into two categories: deferral (Alternatives IV.a

And V.a) and mitigation (Alternatives IV.b and V.b). The deferral conclusion discusses the effects of the alternative with the deferral of blocks and standard mitigation in place. The special mitigation conclusion discusses a situation where the tracts would not be deferred, but special mitigating measures are applied.

The Oil-Spill-Risk Analysis estimates a 46- to 70-percent chance of one or more spills ≥1,000 bbl occurring for Alternative I. For Alternative III, the chance of one or more spills ≥1,000 bbl occurring ranges from 35 to 57 percent. For Alternative IV, the chance of one or more spills ≥1,000 bbl occurring ranges from 39 to 62 percent. For Alternative V, the chance of one or more spills ≥1,000 bbl occurring ranges from 31 to 55 percent. For the cumulative case, the probable most likely number of spills (≥1,000-bbl) is estimated to range from 5 to 11, of which Alternative I is estimated to contribute 1 spill (Table IV.A.2-1). It should be noted that the number of oil spills does not necessarily translate to a difference in environmental effects. A number of statistical variables exists for analyzing effects of oil spills. The size of the spill is one important variable; but the potential effects of that spill also will depend on the number of spills of that size that might occur, the chances of that number of spills of that size occurring (expressed in percentages), and the probability of those spills actually contacting shorelines and living resources. Spills, including large spills, are unlikely to occur in the same area twice and, therefore, the assumed large spills are not expected to contact the same resources over the 21-year life of the field. However, even if a subsequent spill were to contact some of the same areas, it generally is assumed that recovery, which ranges from a few days for phytoplankton to <7 years for some fishes, would have occurred and, therefore, the effects would be very similar to a single-spill event. For additional information on oil-spill assumptions, the reader is directed to Section IV.A.2.

1. Effects on Water Quality:

Alternative I Conclusion: Contaminants from permitted discharges over the life of the field and offshore construction activities for several years could exceed sublethal levels over a few square kilometers. Hydrocarbons from (1) small spills (<1,000 bbl) could result in local, chronic hydrocarbon contamination of water within the margins of the oilfields; and (2) a large oil spill (≥1,000 bbl) could exceed the 1.5-ppm-acute toxic criterion during the first several days of a spill and the 0.015-ppm-chronic criterion for about a month in an area of about 400 km^2. A spill ≥1,000 bbl is estimated to have a 46- to 70-percent chance of occurrence. Regional water quality would not be affected.

Alternative III Conclusion: In comparison to Alternative I, the reductions in the permitted discharge quantities and areas affected by increased turbidity from offshore construction activities might range from about 13 to 25 percent and 17 to 25 percent, respectively.

Alternative IV.a Conclusion: In comparison to Alternative I, the reductions in the permitted discharge quantities and areas affected by increased turbidity from offshore construction activities might range from about 18 to 25 percent and 17 to 25 percent, respectively

Alternative IV.b Conclusion: Special mitigating measures would have no effect in this alternative.

Alternative V.a Conclusion: In comparison to Alternative I, the reductions in the permitted discharge quantities and areas affected by increased turbidity from offshore construction activities might range from about 33 to 50 percent and 33 to 50 percent, respectively.

Alternative V.b Conclusion: The special mitigating measure on OCS pipelines offshore the ANWR (Stipulation 8) might help reduce the risk of a subsea pipeline oil spill. However, the overall effect of the special mitigating measures on water quality are expected to be about the same as under Alternative I.

Comparison: Compared with Alternative I, Alternatives III and IV would feature similar reductions in permitted discharges and area affected by turbidity. The adoption of the proposed block deferrals for Alternative V, however, would see the greatest reduction in permitted discharges and area affected by turbidity. Regarding the effects of special mitigating measures for both alternatives, they would not substantively change the level of effects portrayed in Alternative I for those deferral areas. However, some reduction to the threat of an oil spill contacting the ANWR coastline would be achieved.

Cumulative-Case Conclusion: For the cumulative case, contaminants from permitted discharges over the life of the fields and offshore construction activities for several years could exceed sublethal levels over a few square kilometers; the permitted discharge quantities and areas affected by increased turbidity from offshore construction activities might be up to several times greater than estimated for Alternative I. Hydrocarbons from (1) small spills (<1,000 bbl) could result in local, chronic hydrocarbon contamination of water within the margins of the oilfields; (2) a platform/pipeline oil spill ≥1,000 bbl could exceed the 1.5-ppm-acute criterion during the first several days of a spill, and the 0.015-ppm-chronic criterion for about a month in an area of about 400 km^2; and (3) a tanker spill ≥1,000 bbl could exceed the 0.015-ppm-chronic criterion for more than a month in an area of about 2,400 km^2. Regional water quality in the Beaufort Sea would not be affected but could be degraded for more than a month along the tanker routes in the event of a ≥1,000-bbl spill.

2. Effects on Lower Trophic-Level Organisms:

Alternative I Conclusion: Drilling discharges are estimated to adversely affect <1 percent of the benthic organisms in the sale area. Recovery is expected within a year after the discharges cease. Platform and pipeline construction are estimated to adversely affect <1 percent of the immobile benthic organisms in the sale area. Recovery is expected within 3 years. Marine organisms needing a hard substrate for settlement are expected to benefit from the production platforms and to colonize them within 2 years. If a large oil spill occurred, it is estimated to have lethal and sublethal effects on <1 percent of the phytoplankton and zooplankton in the sale area. Recovery is expected within 2 days for phytoplankton and within a week for zooplankton (2 weeks in embayment areas). The spill also is estimated to have lethal and sublethal effects on <5 percent of the epontic community (assuming a winter spill) and <1 percent of the marine invertebrate larva nearest the surface. Recovery is expected within a month (within a year where water circulation is significantly reduced).

Alternative III Conclusion: Alternative III is expected to have essentially the same effect on lower trophic-level organisms as Alternative I.

Alternative IV.a Conclusion: Alternative IV.a is expected to have essentially the same effect on lower trophic-level organisms as Alternative I.

Alternative IV.b Conclusion: The special mitigation measure for Alternative IV is not expected to benefit lower trophic-level organisms.

Alternative V.a Conclusion: Alternative V.a is expected to have essentially the same effect on lower trophic-level organisms as Alternative I.

Alternative V.b Conclusion: The special mitigation measures for Alternative V.b are not expected to measurably benefit lower trophic-level organisms in the sale area.

Comparison: The effects from the various deferral alternatives essentially would be the same as for Alternative I. Regarding effects of special mitigating measures, they are not expected to benefit lower trophic-level organisms.

Cumulative-Case Conclusion: Effects on lower trophic-level organisms from drilling discharges, seismic surveys, and construction-related activities in the cumulative case are expected to be similar to those of Alternative I. Based on the assumptions discussed in the analysis, cumulative-case oil spills are expected to have about four times the adverse effect of Alternative I on lower trophic-level organisms within the sale area.

3. Effects on Fishes:

Alternative I Conclusion: Overall, fishes exposed to discharges of drilling muds and cuttings and aircraft, vessel, and drilling activities most likely would experience temporary, nonlethal effects. Fishes temporarily may avoid areas where seismic surveys are being conducted and where vessel, aircraft, and drilling activities and construction are occurring during exploration and development/production. The possibility exists that fishes could be adversely affected from the placement on the ice surface of excess dirt from undersea trenching activities. Some fishes are likely to suffer nonlethal effects from an oil spill. Some species could incur significant losses should a spill occur in critical overwintering habitats and in summer feeding areas. However, the probability of an oil spill occurring in general, or specifically occurring in critical overwintering habitat and summer feeding areas is small. The recovery of these populations could take a minimum lifespan time period, e.g. as long as 21 years for least cisco, 17 years for humpback whitefish, and 18 years for broad whitefish, depending on the recruitment from the surviving fishes.

Alternative III Conclusion: The level (magnitude) of disturbance in the deferred area would be reduced from that of Alternative I. The types of effects fish resources are exposed to from Alternative III likely would be similar to those expected under Alternative I and its resource-development scenario

Alternative IV.a Conclusion: The level of disturbance for Alternative IV a would be reduced from that of Alternative I. The types of effects fish resources are exposed to from Alternative IV.a likely would be similar to those expected under Alternative I and its resource-development scenario.

Alternative IV.b Conclusion: The special mitigating measure does not provide any additional protection to the fish resources in the Cross Island Area, especially because undersea pipelines can be constructed in and through the area.

Alternative V.a Conclusion: The types of effects on fish resources from Alternative V.a likely would be similar to those expected under Alternative I and its resource-development scenario. The level of disturbance (magnitude of the effects) for Alternative V.a would be reduced from those of Alternative I.

Alternative V.b Conclusion: These special mitigating measures may provide limited, immeasurable additional protection to fish resources offshore the ANWR by ensuring that offshore activity plans contain a description

of their activities and that the necessary equipment will not need to encroach upon the ANWR. The ITL's will ensure that the FWS is given notice of leasing activities offshore of the ANWR. The special mitigating measures are expected to have about the same reduction of adverse effects to fish resources as the deferral of lease tracts under Alternative V.a.

Comparison: The types of effects on fish resources from Alternatives III, IV and V are expected to be reduced somewhat but similar to those expected under Alternative I. Special mitigating measures for Alternative IV are not expected to reduce effects for the proposed Cross Island deferral area from those portrayed for Alternative I. However, special mitigating measures evaluated for Alternative V are expected to provide fish additional protection, but these measures will achieve the same reduction in effects levels as actual block deferrals.

Cumulative-Case Conclusion: Lethal effects to fishes most likely would occur in nearshore and overwintering habitats rather than in the marine habitat. Fishes are likely to avoid noise and disturbances, if possible. Seismic surveys have the potential to possibly cause lethal effects to fishes. Drilling discharges and pipeline installation, except for the temporary storage of excess dirt, likely would cause local and temporary effects to fishes. The possibility exists that fishes could be adversely affected from the placement, on the ice surface, of excess dirt from undersea trenching activities. Oil spills from Sale 170 would comprise approximately 25 percent of all the spills in the Beaufort Sea area. Generally, oil spills likely would have the most lethal effects on fishes. The effect of Sale 170 to the fish resources in the cumulative case could be nonlethal or lethal, depending on the circumstances involved. Overall, the contribution of Alternative I to the cumulative effects is expected to be of short duration and mostly with nonlethal effects, except in the case of an oil spill in the nearshore and overwintering fish habitats, where the cumulative effects could be significant.

4. Effects on Endangered and Threatened Species:

Bowhead Whale:

Alternative I Conclusion: Overall, bowhead whales exposed to discharges of drilling muds and cuttings, noise-producing activities, and oil spills most likely would experience temporary, nonlethal effects. It is expected that many of the wells likely would be drilled in relatively nearshore waters outside of the main migration route. Bowheads may exhibit temporary avoidance behavior in response to seismic surveys, vessel and aircraft activities, drilling, and construction during exploration and development and production. Avoidance behavior usually begins at distances ranging from 1 to 4 km (0.62-2.5 mi) from a vessel. Observations from studies on the effects of seismic sounds on bowhead whales indicate that bowheads show avoidance behavior to seismic sounds at distances ranging from around 1.3 to 1.5 km (0.81 to 0.93 mi) (Ljungblad et al., 1985; Fraker et al., 1985) to 24 km (14.9 mi) (Koski and Johnson, 1987). Richardson and Malme (1993) stated that most bowheads usually show strong avoidance when an operating seismic vessel is within 6-8 km (3.8-5 mi), and there probably are some effects at greater distances. They also noted that the apparent avoidance response at 24 km (14.9 mi) is the longest-distance avoidance of a seismic vessel documented in the studies they reviewed. Bowheads show avoidance behavior to drilling noise at distances ranging from 0.2 to 5 km (0.12-3.1 mi). Koski and Johnson (1987) observed that one whale appeared to adjust its course to maintain a distance of 23 to 27 km (14.3-16.8 mi) from the center of the drilling operation. The study detected no bowheads within 9.5 km (5.9 mi) of the drillship and few were observed within 15 km (9.3 mi). Hall et al. (1994) indicate that bowheads may avoid drilling noise at ≥20 km (≥12.4 mi). In general, bowheads do not appear to travel more than a few kilometers in response to a single disturbance incident. Behavioral changes may last up to 60 minutes after the disturbance has left the area or the whales have passed, but overall effect on the migration pattern has not been determined. Subtle shifts in direction could cause bowheads to be at greater distances offshore while they migrate westward. Inupiat subsistence whalers state that industrial noise, especially noise due to seismic exploration, has displaced the fall bowhead migration seaward and is thereby interfering with the subsistence hunt at Barrow and Nuiqsut. Whaling captains from Barrow, Nuiqsut, and Kaktovik, in written testimony at the Arctic Seismic Synthesis and Mitigating Measures Workshop on March 5-6, 1997, in Barrow, Alaska, stated: ". . .factual experience of subsistence whalers testify that pods of migrating bowhead whales will begin to divert from their migratory path at distances of 35 miles from an active seismic operation and are displaced from their normal migratory path by as much as 30 miles." Despite the numerous studies, questions regarding the effects of oil and gas activities on bowhead whales have not been resolved and it is not clear whether any amount of research will resolve them (NRC, 1994). Some bowhead whales could be exposed to spilled oil, resulting primarily in temporary, nonlethal effects. Some mortality might result if exposure to freshly spilled oil were prolonged; however, the population is expected to recover to prespill levels within 1 to 3 years.

Alternative III Conclusion: Effects on bowheads expected from Alternative III would be similar to the effects expected under Alternative I While fewer whales may be exposed to oil and gas activities under the deferral than under Alternative I, the extent and nature of the effects and

the overall effect on the population is likely to be essentially the same as under Alternative I.

.Alternative IV.a Conclusion: Effects on bowheads expected from Alternative IV would be similar to the effects expected under Alternative I. While fewer whales may be exposed to oil and gas activities under the deferral than under Alternative I, the extent and nature of the effects and the overall effect on the population is likely to be essentially the same as under Alternative I.

Alternative IV.b Conclusion: Special mitigating measures for Alternative IV will help to ensure that interference with subsistence whaling activities are minimized or eliminated, but are not expected to provide much additional protection to bowhead whales. The effects on bowhead whales are expected to be about the same as under Alternative I. The special mitigating measures would be likely to provide about the same amount of protection to bowhead whales that is provided by not leasing the area offshore Cross Island

Alternative V.a Conclusion: Effects on bowheads expected from Alternative V.a would be similar to the effects expected under Alternative I. While fewer whales may be exposed to oil and gas activities under the deferral than under Alternative I, the extent and nature of the effects and the overall effect on the population is likely to be essentially the same as under Alternative I.

Alternative V.b Conclusion: Special mitigating measures for Alternative V are not expected to provide much additional protection to bowhead whales. The effects on bowhead whales are expected to be about the same as under Alternative I. The special mitigating measures would be likely to provide about the same amount of protection to bowhead whales that is provided by not leasing the area offshore ANWR.

Comparison: The effects expected on bowheads would be similar for all alternatives. Regarding special mitigating measures for Alternatives IV and V, they are not expected to provide much additional protection to bowhead whales. The effects of the special mitigating measures would provide the same amount of protection to the bowheads as not leasing the blocks attributed to the deferral alternatives.

Cumulative-Case Conclusion: Bowheads may exhibit avoidance behavior to vessels and activities related to seismic surveys, drilling, and construction during exploration and development and production. Some bowhead whales could be exposed to spilled oil, resulting in temporary, nonlethal effects, although prolonged exposure to freshly spilled oil could result in lethal effects to a few individuals, with the population recovering to prespill population levels within 1 to 3 years. Overall, bowhead whales exposed to noise-producing activities and oil spills associated with Alternative I and other future and existing projects within the Arctic region—combined with other activities within the range of the migrating bowhead whale—most likely would experience temporary, nonlethal effects. The overall contribution of Alternative I to the cumulative effects is expected to be of short duration and to result in primarily temporary, nonlethal effects.

Spectacled Eider:

Alternative I Conclusion: Overall routine effects on the spectacled eider are expected to be minimal, affecting <2 percent of the population; however, recovery from any substantial mortality resulting from an oil spill is not expected to occur while the current uncertain population status persists.

Alternative III Conclusion: The Kaktovik Deferral Alternative (Alternative III) would produce no significant reduction of routine activity or oil-spill effects on spectacled eiders from that expected under Alternative I. Effects are expected to be minimal, affecting <2 percent of the population; however, recovery from even minimal mortality is unlikely to occur if the current uncertain population status persists.

Alternative IV.a Conclusion: Effects on spectacled eiders under Alternative IV.a would be similar to the effects expected under Alternative I because the level of activity is likely to be similar, essentially the same number of eiders are likely to be affected, and the extent and nature of the effects are likely to be similar

Alternative IV.b Conclusion: Special mitigation for Alternative IV.b. may help to reduce disturbance of the spectacled eider but are not expected to provide much additional protection for this species and, thus, the effects on the eider are expected to be about the same as under Alternative I. The special mitigation is expected to provide about the same amount of protection to the eiders as is provided by not leasing the area offshore Cross Island.

Alternative V.a Conclusion: Alternative V.a would produce no significant reduction of routine activity or oil-spill effects on the spectacled eider from those expected under Alternative I. Effects are expected to be minimal, affecting <2 percent of the population; however, recovery from even minimal mortality is unlikely to occur if the current uncertain population status persists.

Alternative V.b Conclusion: Special mitigating measures under Alternative V.b are expected to provide limited additional protection for the spectacled eider over that provided by Alternative I and, thus, the effects on these species are expected to be about the same. The special mitigating measures likely would provide about the same

degree of protection for these species as is provided by deferral of the area offshore the ANWR.

Comparison: The effects on the spectacled eider expected for Alternatives III, IV, and V would be similar to the effects expected under Alternative I. Special mitigating measures for Alternatives IV and V generally would provide the same amount of protection to the spectacled eider as not leasing the blocks deferred by these alternatives.

Cumulative-Case Conclusion: Effect of routine lethal and nonlethal cumulative factors on the Arctic Slope spectacled eider population is likely to be substantially greater than that associated with Alternative I. Likewise, substantially greater (2 times) spectacled eider mortality (<600 individuals) is expected to result from additional oil spills likely to occur under cumulative assumptions than is expected with Alternative I. Recovery from substantial overall cumulative effect is not expected to occur while the uncertain population status of recent decades persists. The contribution of activities associated with proposed Sale 170 to the cumulative effect on the spectacled eider population is expected to represent perhaps 25 percent.

Steller's Eider:

Alternative I Conclusion: Overall routine effects on the Steller's eider are expected to be minimal, affecting <2 percent of the Alaska population; however, recovery from any substantial mortality resulting from an oil spill is not expected to occur, if the current uncertain population status persists.

Alternative III Conclusion: The Kaktovik Deferral Alternative (Alternative III) would produce no significant reduction of routine activity or oil-spill effects on Steller's eiders from that expected under Alternative I. Effects are expected to be minimal, affecting <2 percent of the population; however, recovery from even minimal mortality is unlikely to occur, if the current uncertain population status persists.

Alternative IV.a Conclusion: Effects on Steller's eiders under Alternative IV.a would be similar to the effects expected under Alternative I, because the level of activity is likely to be similar, essentially the same number of eiders are likely to be affected, and the extent and nature of the effects are likely to be similar

Alternative IV.b Conclusion: Special mitigation for Alternative IV.b may help to reduce disturbance of Steller's eiders but is not expected to provide much additional protection for this species and, thus, the effects on the eider are expected to be about the same as under Alternative I. The special mitigation is expected to provide about the same amount of protection to the eider as is provided by not leasing the area offshore Cross Island.

Alternative V.a Conclusion: Alternative V would produce no significant reduction of routine activity or oil-spill effects on the Steller's eider from those expected under Alternative I. Effects are expected to be minimal, affecting <2 percent of the population; however, recovery from even minimal mortality is unlikely to occur if the current uncertain population status persists.

Alternative V.b Conclusion: Special mitigating measures under Alternative V.b are expected to provide limited additional protection for Steller's eiders over that provided by Alternative I and, thus, the effects on these species are expected to be about the same. The special mitigating measures likely would provide about the same degree of protection for these species as is provided by deferral of the area offshore the ANWR.

Comparison: The effects on the Steller's eider expected for Alternatives III, IV, and V would be similar to the effects expected under Alternative I. Special mitigating measures for Alternatives IV and V generally would provide the same amount of protection to the Steller's eider as not leasing the blocks deferred by these alternatives.

Cumulative-Case Conclusion: Effect of routine lethal and nonlethal cumulative factors on the Arctic Slope Steller's eider population is likely to remain the same as that associated with Alternative I. Likewise, only marginally greater eider mortality is expected to result from additional oil spills likely to occur under cumulative assumptions than is expected under Alternative I (<100 individuals). Recovery from substantial overall cumulative effect is not expected to occur, while the uncertain population status of recent decades persists. The contribution of activities associated with proposed Sale 170 to the cumulative effect on the Steller's eider population is expected to represent perhaps 10 percent.

Arctic Peregrine Falcon:

Alternative I Conclusion: Neither support aircraft nor onshore construction activities far removed from arctic peregrine falcon nest sites are expected to be a source of significant disturbance. There is a very low probability that an oil spill would contact falcons infrequently foraging in coastal areas. The overall effect on peregrine falcons from oil spills and disturbance is expected to be minimal, with <5 percent of the population exposed to potentially adverse factors; no mortality is expected to result from Alternative I.

Alternative III Conclusion: Routine and spill-related effects of the Kaktovik Deferral Alternative on the arctic peregrine falcon are expected to be minimal. Because

exposure of falcons to adverse factors is expected to be insignificant under both Alternative I and this alternative, reduction of adverse effects also is expected to be insignificant.

Alternative IV.a Conclusion: Effects on arctic peregrine falcons under Alternative IV.a would be similar to the effects expected under Alternative I, because this species occurs infrequently in the deferred area.

Alternative IV.b Conclusion: Special mitigation for Alternative IV is not expected to provide much additional protection for the arctic peregrine falcon. The effects on peregrine falcons are expected to be about the same as under Alternative I. The special mitigation is expected to provide about the same amount of protection to the peregrine falcon as is provided by not leasing the area offshore Cross Island

Alternative V.a Conclusion: Routine and spill-related effects of Alternative V.a on the arctic peregrine falcon are expected to be minimal. Because exposure of falcons to adverse factors is expected to be insignificant under both Alternative I and this alternative, reduction of adverse effects is expected to be insignificant

Alternative V.b Conclusion: Special mitigating measures for Alternative V.b are expected to provide limited additional protection for the arctic peregrine falcon over that provided by Alternative I and, thus, the effects on this species are expected to be about the same. The special mitigating measures likely would provide about the same degree of protection for this species as is provided by deferral of the area offshore ANWR.

Comparison: Effects on the peregrine falcon from Alternative I and all of its alternatives is expected to be insignificant. Accordingly, the effects of special mitigating measures are not expected to offer any degree of reduction of effects from that of block deferrals.

Cumulative-Case Conclusion: The cumulative effect of all projects and activities within the range occupied by nesting, migrating, or wintering arctic peregrine falcons is expected to be minimal and short term, with mortality and sublethal effects on <10 percent of the population, and may not be detectable above the natural fluctuations of the population and survey methods/data available. The contribution of activities associated with proposed Sale 170 to the cumulative effect is not expected to represent >10 to 15 percent of the cumulative effect on the arctic peregrine falcon population.

5. Effects on Marine and Coastal Birds:

Alternative I Conclusion: The potential effect of disturbance and habitat alteration on marine and coastal birds would be short-term displacement of nesting, feeding, molting, and staging birds and a potential minor decline in fitness. Oil spills are expected to cause the loss of several thousand birds due to oil contamination. The overall effects of displacement and mortality are expected to be minor at the population level, and may not be detectable above the natural fluctuations of the and survey methods/data available.

Alternative III Conclusion: Under Alternative III disturbance of marine and coastal birds in the deferral area is expected to be negligible; in the remainder of the proposed sale area it would remain the same as that discussed under Alternative I. Because the chance of spill occurrence and contact with habitats from Gwydyr Bay eastward is reduced from Alternative I, risk of oil-spill effects on birds and their habitats also is reduced to a relatively low level. Risk of oil-spill contact remains substantial offshore of Camden Bay, so birds from nesting areas in the ANWR that enter this area when oil is present are expected to sustain spill-generated losses equivalent to those discussed for Alternative I (up to several thousand individuals). The effects of any such losses are expected to be minor at the population level and may not be detectable above the natural fluctuations of the population and survey methods/data available.

Alternative IV.a Conclusion: Effects on marine and coastal birds under Alternative IV.a would be similar to the effects expected under Alternative I (minor population effects), because the level of activity outside the Cross Island buffer is likely to be similar, essentially the same number of individuals are likely to be affected, and the extent and nature of the effects are likely to be similar. In the Cross Island area, where the probability of both disturbance and oil spill effects occurring are likely to be somewhat reduced from that under Alternative I, overall effect is expected to be reduced, though not significantly, from Alternative I.

Alternative IV.b Conclusion: Special mitigation for Alternative IV.b. may help to minimize disturbance of marine and coastal birds in a portion of the deferral area. The effects on marine and coastal species are expected to be about the same as under Alternative I. The special mitigating measure is expected to provide less protection to marine and coastal birds than would not leasing the area offshore Cross Island.

Alternative V.a Conclusion: Under Alternative V.a, disturbance of marine and coastal birds the deferral area is expected to be negligible; in the remainder of the proposed sale area it would remain the same as that discussed under Alternative I. Because the chance of spill occurrence and contact with habitats from Gwydyr Bay eastward, particularly offshore of the western portion of the ANWR, is reduced from Alternative I, risk of oil-spill effects on

birds and their habitats also is reduced to a relatively low level. Risk of oil-spill contact remains substantial offshore of the ANWR, so birds from nesting areas in the ANWR that enter this area when oil is present are expected to sustain spill-generated losses equivalent to those discussed for Alternative I (up to several thousand individuals). The effects of any such losses are expected to be minor at the population level, and may not be detectable above the natural fluctuations of the population and survey methods/data available

Alternative V.b Conclusion: Special mitigating measures under Alternative V.b are expected to provide about the same protection for marine and coastal birds as provided in Alternative I and, thus, the effects on these species are expected to be about the same. The special mitigating measures likely would provide about the same degree of protection to these species as is provided by deferral of the area offshore ANWR.

Comparison: Alternative IV.a and V.a would be similar to Alternative I in effects on marine and coastal birds from both disturbance and oil spills in portions of the deferral adjacent to existing leases; elsewhere in the deferral area effects of both would be reduced somewhat. Alternatives III and V would be similar in effects to Alternative I offshore of the western ANWR in the vicinity of existing leases. Elsewhere in the deferral areas, disturbance would be negligible and risk of a spill reduced to a low level; however, chance of spilled oil contacting birds, and resulting mortality, would be similar to Alternative I. The effects of any losses are expected to be minor at the population level and may not be detectable above the natural fluctuations of the population and survey methods/data available. Special mitigating measures may help to minimize disturbance of marine and coastal birds in a portion of the deferral area but overall would provide about the same level of protection as block deferrals.

Cumulative-Case Conclusion: Cumulative effects from activities within the Arctic Region combined with other activities within the range of migratory birds are expected to be long term (several generations or at least 10 years) on migratory waterfowl, seabird, and shorebird populations. The contribution of Alternative I to the cumulative effects is expected to be generally short term and substantially less than the total estimated mortality associated with overall cumulative effects

6. Effects on Pinnipeds, Polar Bears, and Belukha Whales:

Alternative I Conclusion: The effects from activities associated with Alternative I are estimated to include the loss (due to an oil spill, 46-70% chance) of small numbers of seals (e.g., 75-100 seals out of a winter ringed seal population estimate of 40,000), walruses (<100 out of a population >200,000), polar bears (perhaps 20-40 out a population of 1,300-2,500), and belukha whales (<10 out of a population of >40,000), with populations recovering (recovery meaning the replacement of individuals killed as a consequence of Alternative I) within less than one generation (or 3-5 years).

Alternative III Conclusion: The effect of Alternative III is expected to be similar to the effects of Alternative I, but with effects potentially reduced in the Kaktovik area.

Alternative IV.a Conclusion: The effect of Alternative IV.a on pinnipeds, polar bears, and belukha whales (potential noise and disturbance, oil spill, and habitat alteration) is expected to be reduced slightly in the Cross Island area. However, potential noise and disturbance, oil spill, and habitat effects beyond the Cross Island area are expected to be the same as under Alternative I. The overall effect is expected to be the same as under Alternative I.

Alternative IV.b Conclusion: Stipulation 6 is expected to reduce local noise and disturbance, and habitat effects on seals and polar bears near Cross Island as would the deferral of lease blocks near Cross Island under Alternative IV; but the overall effect is expected to be about the same as under Alternative I.

Alternative V.a Conclusion: The effect of Alternative V.a (noise and disturbance, oil spill, and habitat alteration) is expected to be reduced or avoided on pinnipeds, polar bears, and belukha whales offshore of and on the ANWR, but the overall effect on pinniped, polar bear, and belukha whale populations is expected to be about the same as under Alternative I (such as the loss of perhaps 20-40 polar bears and the loss of small numbers of seals and whales).

Alternative V.b Conclusion: These special mitigating measures are expected to reduce potential noise and disturbance, oil spills, and habitat effects on marine mammals, particularly on polar bears occurring on or adjacent to the ANWR. However, the overall effects on pinnipeds, polar bears, and belukha whales are expected to be the same as under Alternative I. These special mitigating measures are expected to have a similar reduction in adverse effects on polar bears, pinnipeds, and belukha whales as the deferral of lease tracts under Alternative V.

Comparison: Alternative IV may result in some reduction of effects in area in and around Cross Island. Alternatives III and V may engender some reduction general effects in areas adjacent to the ANWR; however, overall effects for all alternatives is expected to be similar to Alternative I. Special mitigating measures are expected to reduce potential habitat disturbance; however, these measures are expected to achieve a similar reduction in effects as the deferral of lease blocks.

Cumulative-Case Conclusion: Cumulative effects are expected to be relatively short term (within 1 generation) on ice seals (ringed, bearded, and spotted seals), polar bears, and belukha whales and longer term (>1 generation to several generations) on harbor seals and sea otters (and perhaps walruses). The contribution of Sale 170 exploration and development is expected to include <20 percent of the oil-spill and other mortality of ice seals, polar bears, walruses, and belukha whales and <10 percent of the mortality and reduced productivity of harbor seals and sea otters.

7. Effects on Caribou:

Alternative I Conclusion: The effects of Alternative I on caribou are expected to include local displacement of cow-calf groups within about 4 km (2.48 mi) along the onshore pipeline roads, with this local effect persisting for more than one generation (and perhaps over the life of Alternative I). Brief disturbances (a few minutes to a few days) of large groups of caribou are expected to occur along the road and pipeline corridor during periods of high traffic over the life of the project, but these disturbances are not expected to affect caribou migrations and overall distribution. If an oil spill occurred under Alternative I, it is expected to result in the loss of no more than a small number of caribou (perhaps 100), with recovery expected within about 1 year.

Alternative III Conclusion: The effect of Alternative III on PCH caribou is expected to be reduced somewhat from that under Alternative I. However, the overall effect on CAH caribou is expected to be about the same as under Alternative I (local displacement of cow-calf groups within about 3-4 km along onshore pipelines with roads, with this local effect persisting for >1 generation and the loss of a small number of caribou and relatively small area of habitat contamination assuming 1 oil spill of 7,000 bbl).

Alternative IV.a Conclusion: The effect of Alternative IV.a on caribou (local displacement of cow-calf groups within about 3-4 km [1.86-2.48 mi] along 32-161 km of onshore pipelines with roads, persisting for >1 generation, and the loss of a small number of caribou and relatively small area of habitat contamination from the assumed 7,000-bbl spill) is expected to be about the same for that under Alternative I. However, there would be about an 8-percentage-point reduction in the chance of one or more oil spills ≥1,000 bbl occurring within the proposed sale area.

Alternative IV.b Conclusion: Special mitigating measure, proposed Stipulation 6, is expected to have the same effect on caribou as Alternative I.

Alternative V.a Conclusion: The effect of Alternative V.a on CAH caribou is expected to be about the same from that under Alternative I (local displacement of cow-calf groups within about 3-4 km [1.86-2.48 mi] along 20-30 mi vs 20-100 mi of onshore pipelines with roads), with this local effect persisting for more than one generation, and the loss of a few hundred CAH caribou to a few thousand PCH caribou and relatively small area of habitat contamination, assuming one oil spill of 7,000 bbl. This alternative is expected to significantly reduce adverse effects on the PCH and on ANWR habitats.

Alternative V.b Conclusion: These special mitigating measures are expected to reduce potential noise and disturbance, oil-spill, and habitat effects on caribou, particularly on PCH caribou occurring on the ANWR. The effect on CAH caribou is expected to be reduced somewhat from that effect under Alternative I. These special mitigating measures are expected to have a similar reduction in adverse effects on PCH caribou as the deferral of lease tracts under Alternative Vb.

Comparison: Effects on caribou for all alternatives would be reduced from those of Alternative I. The reduction would be the greatest for those alternatives with the least amount of pipeline construction. The reduction in pipeline construction would reduce effects on the PCH; however, overall effects on the CAH would remain the same as Alternative I for all alternatives. The mitigating measure for Alternative V will reduce potential adverse effects to the PCH as much as the actual deferral of lease blocks off the ANWR. Implementation of Stipulation 6 for Alternative IV would achieve the same level of effects for the Cross Island area as Alternative I.

Cumulative-Case Conclusion: Cumulative effects on caribou distribution are likely to continue to have long-term (several generations over the life of the oilfields) within about 4 km (2.48 mi) of specific onshore facilities and a general shift of calving away from the oilfields. The cumulative reduction in calving and summer habitat use by cows and calves of the CAH near oilfield facilities (such as road-pipelines with high-traffic levels) may result in a long-term effect on caribou productivity and abundance. However, this potential effect may not be measurable (directly attributable to oil development) due to the great natural variability in caribou population productivity. The contribution of Alternative I to the cumulative case is estimated to be 1 to <5 percent of the local but long-term displacement of caribou-calving habitat and reduced habitat use. If global warming occurs during the next several decades, with widespread changes in vegetation associated with warming temperatures, much longer term effects on caribou may occur.

8. Effects on the Economy of the North Slope Borough:

Alternative I Conclusion: Production is projected to generate increases above the levels without the sale as

follows: property taxes, 1 to 2 percent; direct oil-industry employment, 500 to 1,200; resident employment, 2 to 3 percent. The cleanup operation of an oil spill would generate jobs for up to 300 cleanup workers for 6 months in the first year.

Alternative III Conclusion: Alternative III exploration, development, and production would generate increases that are less than those for Alternative I by 10 to 20 percent for property tax, direct oil-industry employment, and resident employment. Alternative III cleanup operation for an oil spill would generate employment the same as for Alternative I.

Alternative IV.a Conclusion: Alternative IV.a exploration, development, and production would generate increases that are less than those for Alternative I by 20 percent for property tax, direct oil-industry employment, and resident employment. Alternative IV.a cleanup operation for an oil spill would generate employment the same as for Alternative I.

Alternative IV.b Conclusion: There are no effects of special mitigating measures for economics for this alternative and the full level of effects as analyzed for Alternative I would occur.

Alternative V.a Conclusion: Alternative V.a exploration, development, and production would generate increases that are 40 percent less than those for Alternative I for property tax, direct oil-industry employment, and resident employment. Alternative V.a cleanup operation for an oil spill would generate employment the same as for Alternative I.

Alternative V.b Conclusion: There are no effects of special mitigating measures for economics for this alternative.

Comparison: The development of the resource estimate of Alternative III and IV.a would result in a 10- to 20-percent decrease in property tax revenues, direct oil-related employment, and related resident employment. Alternative V.a resources would result in a 40-percent decrease in property tax revenue, oil-industry employment, and resident employment. There are no effects of special mitigating measures for economics for Alternatives IV.b and V.b, and the full level of effects as analyzed for Alternative I would occur.

Cumulative-Case Conclusion: For the cumulative case, the effects on the economy of the NSB are expected to be one-third greater than for Alternative I except for effects from the oil spill, which are the same as for Alternative I.

9. Effects on Subsistence-Harvest Patterns:

Alternative I Conclusion: Overall effects on subsistence-harvest patterns in the communities of Barrow, Nuiqsut, and Kaktovik from the Sale 170 resource estimate as a result of discharges, disturbance effects from seismic activity, aircraft noise, supply-vessel traffic, drilling noise, off- and onshore construction, oil spills, and oil-spill cleanup likely would render one or more important subsistence resources unavailable, undesirable for use, available in reduced numbers, or their pursuit more difficult (with hunters having to travel farther than normal to harvest them) for up to an entire season (1 year).

Alternative III Conclusion: Under Alternative III, effects as a result of disturbance and oil spills on subsistence-harvest patterns in the community of Kaktovik are expected to be slightly reduced from those expected from Alternative I. Effects would be expected to affect subsistence resources for up to an entire season (1 year), but no resource would become unavailable, undesirable for use (although an oil spill affecting any portion of the bowhead whale-migration route might taint resources or create the perception of tainting that would affect the subsistence hunt), or experience overall population reductions. The effects from the Kaktovik Deferral Alternative on the subsistence-harvest patterns for Barrow and Nuiqsut would be the same as for Alternative I.

Alternative IV.a Conclusion: Under Alternative IV.a, effects as a result of disturbance and oil spills on subsistence-harvest patterns in the community of Nuiqsut are expected to be slightly reduced from those expected from Alternative I. Effects would be expected to affect subsistence resources for up to an entire season (1 year), but no resource would become unavailable, undesirable for use (although an oil spill affecting any portion of the bowhead whale-migration route might taint resources or create the perception of tainting that would affect the subsistence hunt), or experience overall population reductions. Effects from the Cross Island Alternative on the subsistence-harvest patterns of Barrow and Kaktovik are expected to be the same as for Alternative I; for Nuiqsut, effects are expected to be slightly reduced from those expected for Alternative I.

Alternative IV.b Conclusion: Special mitigating measure Stipulation 6, Permanent Facility Siting in the Vicinity of Cross Island, is expected to reduce noise and habitat disturbance to seals, polar bears, and bowhead whales near Cross Island and oil-industry conflicts with Nuiqsut subsistence-whaling practices. This special mitigating measure would likely provide the same degree of protection to bowhead whales and the subsistence bowhead-whale harvest that is provided by not leasing the area offshore Cross Island. Consequently, similar reductions on

subsistence-harvest patterns are expected from either special mitigation or deferral.

Alternative V.a Conclusion: Under Alternative V, effects as a result of disturbance and oil spills on subsistence-harvest patterns in the community of Kaktovik and Nuiqsut are expected to be slightly reduced from those expected from Alternative I. Effects would be expected to affect subsistence resources for up to an entire season (1 year), but no resource would become unavailable, undesirable for use (although an oil spill affecting any portion of the bowhead whale-migration route might taint resources or create the perception of tainting that would affect the subsistence hunt), or experience overall population reductions. Effects from the ANWR Alternative on the subsistence-harvest patterns of Barrow are expected to be the same as for Alternative I; for Nuiqsut and Kaktovik effects are expected to be slightly reduced from those expected for Alternative I.

Alternative V.b Conclusion: These special mitigating measures are expected to reduce potential noise and disturbance, oil spills, and habitat effects on fish, marine mammals, and caribou, particularly effects on PCH caribou and marine mammals, primarily on polar bears occurring on or adjacent to the ANWR. These special mitigating measures are expected to have a similar reduction in adverse effects on these species as the deferral of lease tracts under Alternative V.a. The special mitigating measures would be likely to provide the same degree of protection to marine and coastal birds and bowhead whales that is provided by not leasing the area offshore the ANWR. Consequently, similar reductions on subsistence-harvest patterns are expected from either special mitigation or deferral. However, the deferral of lease tracts offshore of the ANWR would avoid most oil-spill risks to the ANWR coastal plain.

Comparison: The effects of Alternative III and V feature a slight reduction in effects on Kaktovik subsistence; with Alternative V offering slightly more protection to Nuiqsut. Alternative IV will slightly reduce effects for Nuiqsut while, under the same Alternative effects to Kaktovik would remain the same as Alternative I. For all Alternatives, effects to Barrows subsistence hunting would remain the same as Alternative I. Special mitigating measures are expected to achieve the same level of effects the actual deferral of blocks in Alternatives IV and V.

Cumulative-Case Conclusion: Overall cumulative effects to subsistence harvests are expected to cause one or more important subsistence resources to become unavailable, undesirable for use, or available only in greatly reduced numbers for a period of 1 to 5 years in Nuiqsut. In Barrow and Kaktovik, overall cumulative effects to subsistence harvests are expected to cause one or more important subsistence resources to become unavailable, undesirable for use, or available only in greatly reduced numbers for a period of 1 to 2 years. The contribution of Alternative I to the cumulative effects would be to affect subsistence resources for up to an entire season (1 year), possibly making them unavailable, undesirable for use, available in reduced numbers, or their pursuit more difficult (with hunters having to travel farther than normal to harvest them); an oil spill affecting any portion of the bowhead whale-migration route might create the perception by subsistence hunters that bowheads, even though available, were undesirable for use (tainted).

10. Effects on Sociocultural Systems:

Alternative I Conclusion: Effects from Alternative I likely would result from industrial activities and changes in population and employment. Effects on subsistence-harvest patterns and effects from possible oil-spill cleanup are expected to disrupt sociocultural systems. Disturbance effects could disrupt sociocultural systems for an entire season (1 year) and create disruption to institutions and sociocultural systems; but these disruptions are not expected to displace ongoing sociocultural institutions; community activities; and traditional practices for harvesting, sharing, and processing subsistence resources.

Alternative III Conclusion: Under Alternative III, effects on sociocultural systems resulting from industrial activities, changes in population and employment, effects on subsistence-harvest patterns, and effects from possible oil spills and oil-spill cleanup are expected to disrupt sociocultural systems. The effects from the Kaktovik Deferral Alternative on the sociocultural systems in the community of Kaktovik are expected to be slightly reduced from those expected for Alternative I due to decreases in oil-spill risks and construction and oil-spill-cleanup disturbance. Effects to sociocultural systems in the communities of Barrow and Nuiqsut would be the same as for Alternative I.

Alternative IV.a Conclusion: Under Alternative IV.a, effects on sociocultural systems could result from industrial activities, changes in population and employment, effects on subsistence-harvest patterns, and effects from possible oil spills and oil-spill cleanup. The effects from the Cross Island Deferral Alternative on the sociocultural systems in the community of Nuiqsut are expected to be reduced from those expected for Alternative I due to decreases in oil-spill risks and construction and oil-spill-cleanup disturbance. Effects to sociocultural systems in the communities of Barrow and Kaktovik would be the same as for Alternative I.

Alternative IV.b Conclusion: This special mitigating measure is expected to reduce potential noise and disturbance to bowhead whales and reduce or eliminated

oil industry conflicts with the subsistence bowhead whale harvest. This special mitigating measure is expected to have a similar reduction in adverse effects on the subsistence bowhead whale harvest as the deferral of blocks under Alternative IV.a. Consequent reductions to disruptions to the sociocultural systems in Nuiqsut are expected from either special mitigation or deferral

Alternative V.a Conclusion: Under Alternative V.a, effects on sociocultural systems resulting from industrial activities, changes in population and employment, effects on subsistence-harvest patterns, and effects from possible oil spills and oil-spill cleanup are expected to disrupt sociocultural systems. The effects from the ANWR deferral on the sociocultural systems in the communities of Kaktovik and Nuiqsut are expected to be slightly reduced from those expected for Alternative I due to decreases in oil-spill risks and construction and oil-spill-cleanup disturbance. Effects to sociocultural systems in the communities of Barrow and would be the same as for Alternative I.

Alternative V.b Conclusion: These special mitigating measures are expected to reduce potential noise and disturbance, oil spills, and habitat effects on fish, marine mammals, and caribou (particularly effects on PCH caribou) and marine mammals (primarily on polar bears) occurring on or adjacent to the ANWR. These special mitigating measures are expected to have a similar reduction in adverse effects on these species as the deferral of lease tracts under Alternative V. The special mitigating measures likely would provide the same degree of protection to marine and coastal birds and bowhead whales that is provided by not leasing the area offshore the ANWR. Special mitigation is expected to have no mitigating effect on socioeconomic effects. Consequent reductions, similar to the reduced effects expected for subsistence resources, to disruptions to the sociocultural systems in Nuiqsut and Kaktovik are expected from either special mitigation or deferral.

Comparison: Alternative III and V feature a slight reduction in effects on Kaktovik's sociocultural systems; with Alternative V offering slightly more protection to Nuiqsut. Alternative IV will slightly reduce effects for Nuiqsut, while under the same Alternative effects to Kaktovik would remain the same as Alternative I. For all Alternatives effects to Barrows sociocultural systems would remain the same as Alternative I. Special mitigating measures are expected to achieve the same level of effects the actual deferral of blocks in Alternatives IV and V. In any case, special mitigating measures will have no effect on the socioeconomic effects of oil and gas development.

Cumulative-Case Conclusion: Because of its proximity to most ongoing oil-development activities on the North Slope, cumulative effects on sociocultural systems could cause chronic disruption of sociocultural systems in the community of Nuiqsut for a period of 2 to 5 years but with no tendency toward displacing existing institutions or social organization. Barrow and Kaktovik could experience chronic disruption to sociocultural systems for a period of 1 to 2 years but with no tendency toward displacing existing institutions or social organization. The contribution of Alternative I to the cumulative effects would be disturbance effects that could disrupt sociocultural systems for an entire season (1 year) and create disruption to institutions and sociocultural systems; but these disruptions are not expected to displace ongoing sociocultural institutions, community activities, and traditional practices for harvesting, sharing, and processing subsistence resources.

11. Effects on Archaeological Resources:

Alternative I Conclusion: The expected effect on historic shipwrecks should be low because of the requirement for review of geophysical data prior to any lease activities. Although oil-spill effects on onshore archaeological resources are uncertain, data from the EVOS indicate that few onshore archaeological resources (<3%) are likely to be significantly affected by an oil spill.

Alternative III Conclusion: The effects from the Kaktovik Deferral Alternative (Alternative III) would be the same as for Alternative I.

Alternative IV.a Conclusion: The effects from the Cross Island Deferral Alternative (Alternative IV.a) would be the same as for Alternative I.

Alternative IV.b Conclusion: Special mitigating measures would have no effect in this alternative. There would be no differences in levels of effects whether or not the blocks were deferred..

Alternative V.a Conclusion: The effects from Alternative V would be the same as for Alternative I.

Alternative V.b Conclusion: Special mitigating measures would have no effect in this alternative. There would be no differences in levels of effects whether or not the blocks off the ANWR were deferred.

Comparison: The effects indicated for Alternative I are essentially the same as for all its alternatives. Special mitigating measures would have no effect for either Alternative IV or V.

Cumulative-Case Conclusion: Cumulative effects on archaeological sites are expected to be similar to those of Alternative I. The analysis completed for Alternative I indicates that the expected effect on archaeological resources remains low. In the event that an increased

amount of bottom-disturbing activity takes place, in-place State and Federal laws and regulations should mitigate effects to archaeological resources. The expected effect on onshore archaeological resources from an oil spill is uncertain, but data from the EVOS indicate that <3 percent of the resources within a spill area would be significantly affected. The contribution of Alternative I in the cumulative case may slightly increase the potential for conflicts with the ANWR CCP management directives discussed above, but only in the unlikely event of an oil spill

12. Effects on Air Quality:

Alternative I Conclusion: Activity associated with Alternative I would result in a small, localized increase in the concentrations of criteria pollutants. Concentrations would be within the PSD Class II limits and National Air Quality Standards. Therefore, effects from Alternative I would be low.

Alternative III Conclusion: The effects of Alternative III on air quality are expected to be the same as for Alternative I.

Alternative IV.a Conclusion: Alternative IV.a is expected to have essentially the same effect on air quality as Alternative I.

Alternative IV.b Conclusion: Special mitigating measures would have no effect on air quality. There would be no differences in levels of effects whether or not the blocks around Cross Island were deferred.

Alternative V.a Conclusion: Alternative V.a is expected to have less of an effect on air quality than Alternative I.

Alternative V.b Conclusion: Special mitigating measures would have no effect on air quality. There would be no differences in levels of effects whether or not the blocks off the ANWR were deferred.

Comparison: The effects indicated for Alternative I are essentially the same as for all of its alternatives. Special mitigating measures would have no effect on air quality.

Cumulative-Case Conclusion: The effects associated with the cumulative case essentially would be the same, qualitatively, as those discussed for Alternative I. Predicted concentrations would be well within the PSD Class II incremental limits and National Air Quality Standards. Effects on onshore air quality from cumulative-case emissions are expected to be low. Consequently, a minimal effect on air quality with respect to standards is expected.

13. Effects on Land Use Plans and Coastal Management Programs:

Alternative I Conclusion: For Alternative I, conflicts could occur with specific Statewide standards and NSB CMP policies related to the potential for user conflicts between development activities and access to subsistence resources. Conflicts are possible with the NSB CMP policy related to adverse effects on subsistence resources. These effects would occur in the unlikely event of spilled oil contacting subsistence resources and habitats and the activities associated with oil-spill cleanup. No conflicts are anticipated for an exploration-only scenario.

Alternative III Conclusion: For Alternative III, the effects of potential conflicts on land use plans and coastal management programs are expected to be the same as for Alternative I: conflicts could occur with specific Statewide standards and NSB CMP policies related to the potential for user conflicts between development activities and access to subsistence resources. Conflicts are possible with the NSB CMP policy related to adverse effects on subsistence resources. These effects would occur in the unlikely event of spilled oil contacting subsistence resources and habitats, and the activities associated with oil-spill cleanup. No conflicts are anticipated for exploration only, with the exception that the Kaktovik Deferral Alternative would reduce the possibility of conflicts with the Kaktovik subsistence-harvest area by reducing the possibility of noise-related disturbances affecting the harvest area.

Alternative IV.a Conclusion: For Alternative IV.a, the potential for conflict with land use plans and coastal management programs would be the same as for Alternative I. Conflicts could still occur in two main areas: (1) conflicts could occur with specific NSB CMP policy related to the potential for user conflicts between development activities and access to subsistence resources, Policy 2.4.3(d) (NSBMC 19.70.050.D); and (2) conflicts are possible with the NSB CMP policies related to adverse effects on subsistence resources, Policy 2.4.3(a) (NSBMC 19.70.050.A) and Policy 2.4.5.1(a) (NSBMC 19.70.050.J.1). The potential for conflict related to subsistence activities for the communities of Barrow and Kaktovik would remain the same as for Alternative I. A slight reduction in the potential for conflicts could occur, but not be eliminated, as a result of small reductions in effects on the subsistence-harvest patterns in the community of Nuiqsut. However, the overall potential for conflict would remain the same as for Alternative I.

Alternative IV.b Conclusion: Stipulation 6 could reduce the potential for conflict with the NSB CMP policies related to adverse effects on subsistence resources and reasonable subsistence-user access to subsistence resources as they relate to subsistence activities in the community of

Nuiqsut. The potential for conflict related to subsistence activities in the communities of Barrow and Kaktovik are expected to be the same as that for Alternative I. Although the potential for conflict might be reduced for the community of Nuiqsut, it is not eliminated. The overall potential for conflict would remain the same as for Alternative I. This conclusion is the same as that for the Cross Island Alternative IV.a.

Alternative V.a Conclusion: For Alternative V.a, the potential for conflict with land use plans and coastal management programs would be the same as that for Alternative I. Conflicts could occur in two main areas: (1) conflicts could occur with specific NSB CMP policy related to the potential for user conflicts between development activities and access to subsistence resources, Policy 2.4.3(d) (NSBMC 19.70.050.D); and (2) conflicts are possible with the NSB CMP policies related to adverse effects on subsistence resources, Policy 2.4.3(a) (NSBMC 19.70.050.A) and Policy 2.4.5.1(a) (NSBMC 19.70.050.J1). A slight reduction in the potential for conflicts could occur as a result of small reductions in effects on the subsistence-harvest patterns in the communities of Kaktovik and Nuiqsut. However, the overall potential for conflict would remain the same as for Alternative I.

Development on the coastal plain of the ANWR has not been authorized by Congress. None of the pipeline routes are assumed to traverse the refuge; no conflict with ANWR policy is inherent in the scenario for Alternative I, and remains the same for the ANWR Alternative.

Alternative V.b Conclusion: These special mitigating measures could reduce the potential for conflict with the NSB CMP policies related to adverse effects on subsistence resources and reasonable subsistence-user access to subsistence resources as they relate to the communities of Nuiqsut and Kaktovik. However, the overall potential for conflict would remain the same as for Alternative I. This conclusion is the same as that for Alternative V.a.

Comparison: Effects levels for Alternatives III, IV.a, and V.a are expected to be similar to Alternative I. Slight reductions in potential CZM/land use conflicts could occur as a result of reductions of effects to Kaktovik (Alternative III), Nuiqsut (Alternative IV), and Kaktovik and Nuiqsut (Alternative V). Special mitigating measure for Alternatives IV and V could reduce the potential for CZM/land use conflicts; however, even with the special mitigating measures the overall potential for conflict would remain the same as for Alternative I.

Cumulative-Case Conclusion: The contribution of Alternative I to the cumulative case increases the potential for conflicts with the policies identified for Alternative I (user conflicts between development activities and access to subsistence resources, and adverse effects on subsistence resources), and additionally presents the potential for conflict with two more policies: energy-facility siting and transportation and utilities.