Document 011

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December 26, 2006

Mr. John Goll
Minerals Management Service
3801 Centerpoint Dr. Suite 500
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Dear Mr. Goll:

This letter comprises comment on the proposed Chukchi Sea Oil and Gas Lease Sale 193 Draft Environmental Impact Statement in addition to what we already submitted in our December 22, 2006 letter with other conservation organizations. I am providing these comments on behalf of our organization and its over 1,700 members.

We are concerned about the high risks to fish and wildlife resources of local, national and international importance from the proposed lease sale and resultant oil exploration, development and production. At this time, the only alternative we can support is "Alt. II, No Lease Sale."

The Chukchi Sea is a remarkable ecosystem that should not be seen merely as gridded lease blocks. While the oil men see this reach of the Arctic Ocean as the "last Frontier" where maybe they will hit it big (but most likely not, according to MMS's own statements), it is also a scientific frontier in that so little is known about this marine ecosystem especially in light of rapid climate change.

The Chukchi is part of the circumpolar Arctic Ring of Life, named by the polar bear biologist Uspenski, which now faces extreme changes due to global warming that put its essence – the polar bear—at risk of extinction within our life times. The Chukchi Polynya with its open waters and wide leads is a vital life stream running off its coast which contains bird and mammal life even in the darkest, coldest times of the winter contrary to the stereotype of icy winter conditions. The polynya supports spring migrations of millions of migratory birds, beluga whales, bowhead whales, and benthic feeding by Pacific walrus and gray whale. There are rich feeding areas for birds, whales and walrus located far offshore and the fall bowhead migration traverses the Chukchi Sea to Russian waters. Most of the world's population of Pacific walrus summers in the Chukchi Sea, according to the U.S. Fish & Wildlife Service.[1]

The nature of the polynya and other open water leads, as well as pack ice and its biologically productive ice edge -- and likely also the geographic use by fish and wildlife -- has been altered

[1] U.S. Fish and Wildlife Service, Marine Mammals Management. Walrus Fact Sheet. http://alaska.fws.gov/fisheries/mmm/walrus/nhistory.htm (Accessed December 26, 2006).

due to climate change and may continue rapidly changing in the foreseeable future. Although MMS provides a map showing some aspects of the Polynya's recent extent, it does not correlate this with changes in habitat use by marine mammals, birds, and fish and impacts of oil and gas activities.. MMS failed to analyze the full ramifications of climate change and impacts of oil and gas activity on fish and wildlife in light of the potential summer disappearance of Arctic Ocean sea ice, projected to occur as early as 2040 according to a recent study by the National Center for Atmospheric Research (NCAR).[2] Given the significance of the Chukchi Sea to summering Pacific walrus, MMS made an egregious omission by not analyzing cumulative impacts of climate change to this species.

011-001

A recent Shell Oil advertisement notes that "the melting of arctic waters off the North Slope has made offshore drilling there more feasible."[3] It appears that Shell Oil and other oil companies' increasing interest in oil leasing and production in the Chukchi and Beaufort Seas is due (at least in part) to increasing ice-free waters caused by climate change. Therefore, MMS needs to address climate change alternations in the existing environment during the time period of the lease program activities, and cumulative effects including increased risks of from hazards such as summer storms, permafrost melting, and impacts including spills, noise disturbance, increased shipping traffic, and greater mortality caused by vessel strikes. The potential leases sold in Sale 193 could be expected to have a duration to 2040 (since MMS assumes that production will occur) therefore it is reasonable to analyze climate change impacts including consequences for the oil activities themselves from permafrost melting, ice changes, temperature warming, etc. for that time period.

011-002

Even back in 1989, Shell Oil "indicated earlier it might consider tankering crude, but the decision would depend on the location of the field and its proximity to shore,"[4] therefore chances may increase that tanker transport of crude oil or liquefied natural gas could result and so these impacts need to be analyzed due to the high potential consequences. MMS needs to evaluate oil spills, disturbance, and habitat impacts to fish, wildlife, wilderness values of shorelines, and subsistence from potential port locations, as well as potential lightering sites at oil production platforms (including tankers used for oil production tests during the delineation and development drilling phase), and tanker transportation to market. The DEIS needs to evaluate the effects of a tanker spill.

011-003

The sea ice study's lead author Dr. Marika Holland stated, "Our research indicates that society can still minimize the impacts on Arctic ice,"[5] by reducing greenhouse gas emission. MMS needs to analyze cumulative impacts of oil and gas and climate change impacts under a range of modeled future conditions. The MMS should also evaluate an alternative wherein the national need for energy is met using efficiency, clean renewables and national policy of greenhouse gas emissions.

011-004

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2 Marika M. Holland, Cecilia M. Bitz, and Bruno Tremblay. December 12, 2006. Future Abrupt Reductions in the Summer Arctic Sea Ice. *Geophysical Research Letters*.

[3] Shell Exploration & Production. September 25, 2006. "Congressional Quarterly Summit - Special Advertising Section in: *Congressional Quarterly*.

[4] *Offshore Magazine*. March 1989. The Chukchi Challenge: Shell probes Chukchi Sea for Prudhoe extension. Pp. 21-30.

[5] See http://www.ucar.edu/news/releases/2006/arctic.shtml (accessed Dec. 26, 2006).

In the Arctic Ring of Life, the land is tied to the sea. Coastal communities depend on the marine life migrating nearby but traveling far from their shores and so rely on the health of the larger Chukchi Sea and the Beaufort Sea. Pacific walrus and spotted seals haul out along the coast yet feed in the ocean. Belugas migrate through the Chukchi Sea to calve in Kasegaluk Lagoon, yet the risks to the animals and their habitats were downplayed in the DEIS. Cumulative effects from oil spills, and disturbance to the sensitive belugas, nesting migratory birds and subsistence in Kaselaguk Lagoon, including the Special Area designated within the National Petroleum Reserve-Alaska need to be analyzed. The spectacled eider winter critical habitat at Ledyard Bay along the arch of coast south of Point Lay is used by for birds depending on tundra nesting in the National Petroleum Reserve-Alaska. The seabirds nesting on high cliffs at Ann Stevens Cape Lisburne and Cape Thompson Units of the Chukchi Unit of the Alaska Maritime National Wildlife Refuge go out to sea for feeding in a radius far from the bluffs. Relatively little is known about the status Chukchi polar bear population yet it is vitally important to Russia and the U.S. as acknowledged in the recent bilateral treaty regarding their conservation and indigenous harvests, as well as to uphold U.S. obligations under the Agreement on the Conservation of Polar Bears. None of the risks to these resources for a full range of alternatives was fully analyzed by the DEIS.

011-005

Offshore oil operations would cross boundaries of land and sea. Oil exploration is expected to entail transportation across the land by drill rigs and supplies, including across the National Petroleum Reserve-Alaska. Oil production requires pipelines (unless oil supertankers are used) across the National Petroleum Reserve-Alaska to the Trans-Alaska Pipeline, and the proposed route(s) should be shown and analyzed for impacts as it is an integral part of the leasing scenario.[6] Such onshore pipelines and road networks would affect a number of caribou herds yet such effects were not adequately analyzed. The potential risks of oil spills to the important denning area at Russia's Wrangel Island Reserve as well as harm from seismic exploration and other disturbance or alteration to their food sources and migratory routes were inadequately described in the DEIS. The cumulative effects to fish and wildlife and subsistence from oil and gas activities in both the Chukchi and Beaufort Seas need to be better analyzed (see attached map: Proposed Offshore Seismic, Leasing and Drilling in Arctic Ocean).

011-006

MMS fails to describe the past controversies from the State of Alaska and Alaska Native communities and organizations regarding Chukchi Sea leasing including issues of oil spill response capability to respond to major spills and the special sensitivity of significant areas in 1980's lease sale areas.[7] Furthermore, MMS ignores past impacts of activities resulting from its earlier Chukchi Sea oil and gas leasing program, nor does it describe potential impacts from

011-007

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[6] MMS needs to provide a current scenario of the expected routes and cumulative effects with onshore oil and gas industry development. MMS has portrayed pipeline routes s from the Chukchi Sea across the NPR-A connecting at Pump Station 1 and Pump Station 2 in the past; cumulative infrastructure was compiled from many Interior Department sources in a map, Arctic Alaska: Offshore and Onshore oil and gas development proposed by the U.S. Department of the Interior. In: P.A. Miller, D. Smith and P.K. Miller. 1993. Oil in Arctic Waters. Anchorage: Greenpeace.

[7] Anchorage Daily News. August 4, 1990. native groups fear development in possibly oil-rich Chukchi sea.
Anchorage Times. June 10, 1989. Drilling delay requested:Cowper demands proof for cleanup capability.
Anchorage Times. June 14, 1989. Feds withdraw lease sale land.
Anchorage Daily News. September 16, 1990. North Slope mayor opposes lease sale.
Anchorage Daily News. January 14, 1991. Eskimos oppose offshore drilling.

detailed hazard surveys. There are no maps showing the locations of wells drilled or the grids where 156,000 miles of seismic exploration surveys were shot and how those affected existing fish and wildlife resources.

For example, monitoring studies showed that exploratory drilling operations altered distribution of Pacific walrus. The studies found that thousands of walrus encountered the drill ships and ice breakers, and walrus moved up to 15.5. miles away from drill ships and icebreakers and farther into the pack ice.[8] In 1989, Shell likely violated the Marine Mammal Protection Act when a walrus calf ended up in the open area in the hull of the drill ship where drilling took place on July 6 to 8 and it may have been poisoned with hydraulic fluid. Shell Oil (Shell Western E&P Inc.) reported that the walrus was shaking, lethargic, and unresponsive on July 8th at which time it removed it from the drill ship opening and released it overboard after which time it was not seen again.[9] Existing levels of contaminants and analysis of cumulative effects on Pacific walrus and other species should be considered, as high levels of cadmium and other heavy metals have been recorded in this species, and tissues of walrus in the Chukchi Sea also were reported to contain refined hydrocarbons.[10]

011-008

The Interior Department's proposed action to lease roughly 33 million acres of sensitive marine habitats in the Chukchi Sea is an extreme action. Hasty, wholesale leasing of the entire planning area is contrary to the targeted "special interest sale" approach approved in the 2002-2007 Five-year Plan. Furthermore, the accelerated nature of the process, including hurried consideration of pre-lease seismic surveys because industry wanted them, runs contrary to the orderly process required by OCLSAA. For this reason alone, Sale 193 should be cancelled as it was improperly started under the current Five-Year plan. Due to MMS's need to collect additional of baseline information in order to meet OCSLAA's requirements, and because of the high consequences of permanently dedicating vast areas of the pristine Chukchi Sea to oil activities, we believe that neither Sale 193 nor any other Chukchi Sea sales should be included in the Five-Year Plan for 2007-2012. MMS cannot use the excuse that it needs some information in order to conduct national assessments of the resource potential as seismic exploration and drilling occurred in the Chukchi Sea in the past. MMS has already shown how small the potential hydrocarbon resources are compared with areas already open to industry in the Gulf of Mexico – and even more importantly, how insignificant the oil and gas potential is compared with small increases in efficiencies in car and small truck mileage standards.

011-009

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[8] Brueggeman, J.J., C.I. Malme, R.A. Grotefendt, D.P. Volsen, J.J. Burns, D.G. Chapman, K.K. Ljungblad, and G.A. Green. 1990. 1989 walrus monitoring program: The Klondike, Burger, and Popcorn prospects in the Chukchi Sea. Houston: Ebasco Environmental for SWEPI.

[9] Shell Western E&P Inc. July 21, 1989. Letter from Wayne F. Simpson, Manager Regulatory Affairs to Walter Steiglitz, Regional Director, U.S. Fish and Wildlife Service, Anchorage.

Trustees for Alaska, Eskimo Walrsu Commission, and Rural Alaska Resources Association. August 14, 1990. Petition for review from a final decision by the Secretary, U.S. Department of the Interior. U.S. Court of Appeals for the Ninth Circuit, No. 90-70404.

Anchorage Times. June 9, 1990. Wandering walrus calf spurs Shell permit filing; Groups petition court to force rig out of Chukchi.

Anchorage Times. July 7, 1990. Chukchi drilling bothers walrus, Trustees charge.

[10] Sease, J.L. and D.G. Chapman. 1988. Pacific walrus. Pp. 17-38 in: Lentfer, J.W. ed. Selected marine mammals of Alaska. Washington DC, Marine Mammal Commission.

Taylor, D.L., S. Schliebe, and H. Metzger. 1989. Contaminants in blubber, liver, an dkidney tissue of Pacfiic waruses. Marine Pollution Bulletin 20(9): 465-468.

As the National Research Council (2003) noted in *Cumulative environmental effects of oil and gas activities on Alaska's North Slope* and in its earlier study, *Environmental Information for Outer Continental Shelf Oil and Gas Decisions in Alaska* (1994), there are adverse impacts to Alaska Native communities that take place from the leasing process itself and these have ramifications for Environmental Justice. The NRC studies identified many significant data gaps that still have not been addressed.

011-010

This Sale 193 lease plan and DEIS fails to meet its required trust responsibilities for fish and wildlife resources, trust responsibilities to federally recognized tribes, subsistence management responsibilities under ANILCA Title 8, and balanced management of the marine resources in the OCS as required by OCLAA. Furthermore, the National Marine Fisheries Service (NMFS) as cooperating agency appears to have taken a back-seat role in this DEIS. NMFS is involved with confusing and overlapping NEPA reviews regarding seismic surveys in the Chukchi Sea since it is separately doing another EIS process on seismic surveys related to its Marine Mammal Protection Act responsibilities related to incidental take and harassment. However, mitigation measures related to seismic surveys should be part of the MMS's proposed Chukchi Sea lease stipulations.

011-011

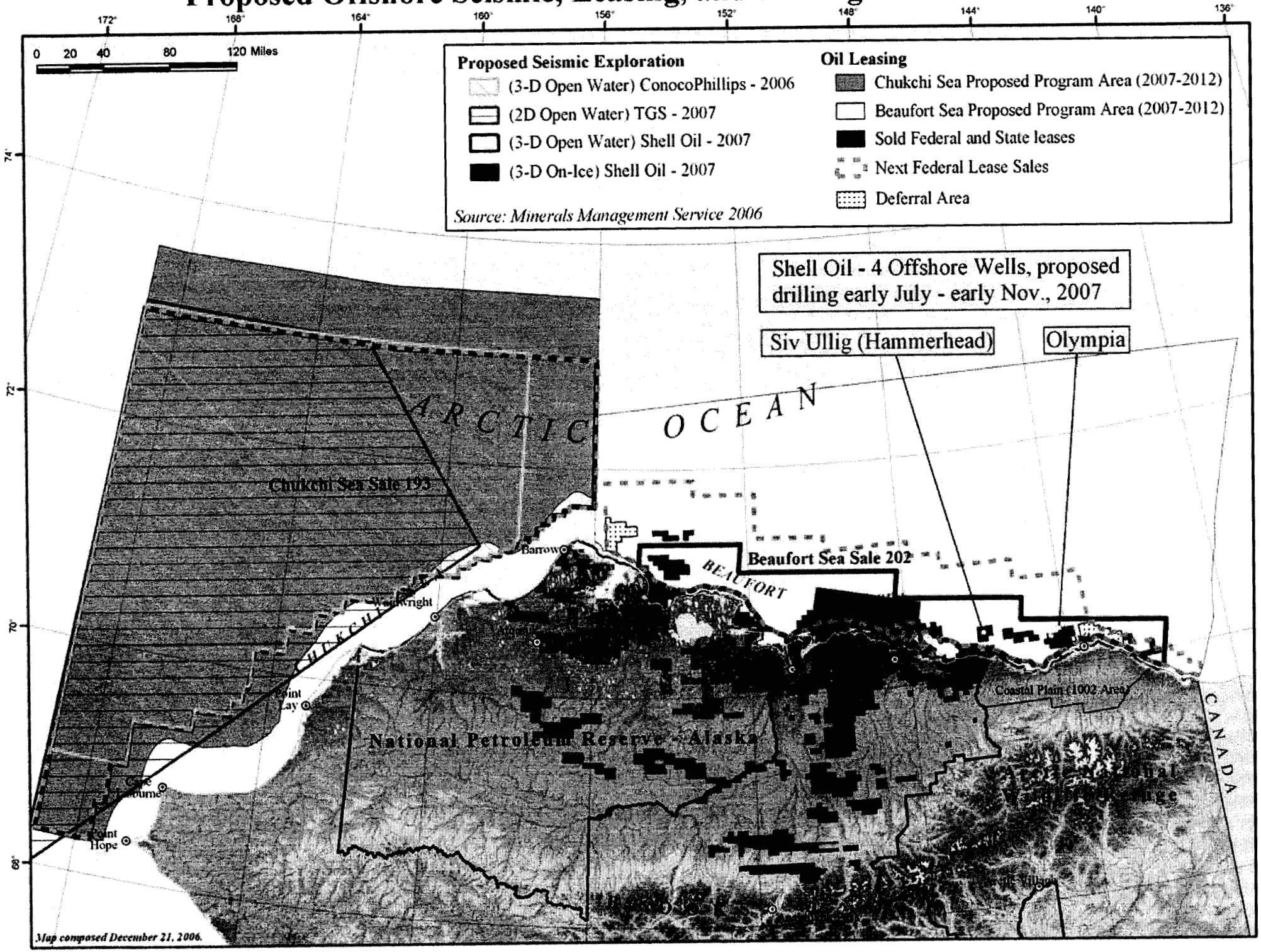
In conclusion, we support Alternative II, "NO LEASE SALE" as cancellation of this sale is the only reasonable course at this time.

Sincerely,

Pamela A. Miller
Arctic Coordinator

Attachment: Map - Proposed Offshore Seismic, Leasing and Drilling in Arctic Ocean

Proposed Offshore Seismic, Leasing, and Drilling in Arctic Ocean



MMS Responses to Northern Alaska Environmental Center Comments

NAEC 011-001

The commenter suggests that MMS made an "egregious omission by not analyzing cumulative impacts of climate change to" walruses. However this topic was covered in depth in the EIS. The commenter is referred to Sections V.C.8.b and III.B.6.a(5) for a discussion of the potential effects of climate change on walrus.

NAEC 011-002

The effects of arctic warming to date are reflected in the description of the existing environment in Section III. The cumulative analyses consider the future effects of climate change to the extent possible considering the uncertainly in the future trend and rate of climate change. The cumulative analyses address impacts from factors such as oil spills, noise, and vessel traffic. In their draft guidance dated October 8, 1997, CEQ recommends addressing global climate change at the program level rather than at the project level. The contribution of OCS activities to greenhouse gas emissions are discussed at the programmatic level in the final EIS for the 2002-2007 OCS Leasing Program (USDOI, MMS, Herndon, 2002:Sec. 4.1.2) and in the draft EIS for the 2007-2012 OCS Leasing Program (USDOI, MMS, 2006c:Sec. IV.A.1).

NAEC 011-003

Arctic warming could change the feasibility of marine transportation through the Arctic. However, considering the volume of potential oil production and seasonal sea ice restrictions on marine traffic, for the foreseeable future the most practical way to transport oil from the Chukchi Sea OCS would be by pipeline across NPR-A and then through the established TAPS and tanker route. If this situation changes these transportation assumptions will be reviewed. If alternative plans are seriously proposed appropriate NEPA analyses will be conducted. At this time, the specifics of future development are vague, because commercial discoveries have not been made. We believe that the development scenario includes realistic engineering and economic assumptions. Some aspects of marine transportation and operations (supply to a new shore base and seismic surveys, among others) are covered in the EIS. We do not attempt to incorporate all of the preliminary development strategies of every company at this early stage of leasing and exploration. There will be ample time for subsequent detailed analysis of a specific project when it is officially proposed.

NAEC 011-004

Climate change will have a variety of effects. The description of the affected environment (Sec. III) notes past changes to the Arctic on a resource-by-resource basis. We evaluate the effects of Arctic climate change over the life of the project on a resource-by-resource basis in the effects of the project (Section IV) and in cumulative effects (Section V). Evaluation of oil and gas and alternatives to providing the Nation's energy supply was appropriately analyzed under Alternative 5 - No Lease Sale (that is, no leasing) in the EIS for the 2002-2007 5-Year Program EIS (USDOI, MMS, Herndon, 2002). The EIS for Lease Sale 193 tiers from this programmatic analysis. In the Sale 193 EIS, the programmatic analysis is reflected in our evaluation of Alternative 2 - No Lease Sale.

NAEC 011-005

Oil-spill and cumulative impacts, as they relate to Pacific walruses, spotted seals, and beluga whales in Kasegaluk Lagoon, are discussed in Section IV.C.1.l, Subsistence-Harvest Patterns, and in an expanded cumulative effects discussion in Section V.C.12, Subsistence-Harvest Patterns. Subsistence issues in Russian Chukotkan coastal communities are discussed in the same sections.

We believe that the scope of the cumulative analysis is appropriate for this EIS and is in accordance with the provisions of NEPA regulations to keep EIS's concise and no longer than absolutely necessary (40 CFR

1502.2(c)), to evaluate actions at a level of detail appropriate to focus issues relevant to the decisionmaking process. While the level of detail for this cumulative impact analysis is less broad than that of the 5-Year Program, it is considerably more focused for the level of detail necessary for an individual lease sale. This approach is in keeping with NEPA (40 CFR 1502.20), involving the use of a tiered approach of analyses.

NAEC 011-006

Onshore pipeline and road impacts are discussed in the subsistence impacts section, as well as in the cumulative effects discussion. Trans-boundary impacts on Chukchi Sea coastal communities from oil spills are also discussed in these sections.

NAEC 011-007

As stated in Section II.B.5, the issues addressed in the EIS have been identified through the scoping and comments on draft EIS's for past leases sales, as well as from the scoping process for this EIS. Section II.B.5.a(1) specifically identifies the issue of oil-spill-response capabilities in the Chukchi Sea environment. Oil spill prevention and response is discussed in Section IV.A.5. The MMS regulations at 30 CFR 254 specify the requirements for oil-spill-response plans.

The effects of past OCS activities are incorporated in the descriptions of the current states of the environmental resources in Section III. The cumulative analysis in the EIS includes the effects of past OCS activities if there are any continuing or future impacts associated with those past activities. For example, seismic surveying on existing leases issued as a result of past lease sales in the Beaufort Sea is included in the scenario for the cumulative analysis.

The impacting factors associated with 3D/2D and high-resolution surveys are similar. These surveys vary in the level of acoustic energy used and the density of the data collection. Each analyst makes a determination on how to address impacts to their resource(s) of expertise. Some analysts have separated out the analysis of high-resolution seismic surveys from the analysis of 3D/2D seismic surveys because of differences in potential impacts or appropriate mitigation measures (e.g., see Sec. IV.C.1.f(1), Threatened and Endangered and Marine Mammals). Other analysts have discussed the potential impacts of sound from both 3D/2D and high-resolution seismic surveys under one heading (e.g., see Sec. IV.C.1.g, Marine and Coastal Birds).

The locations of the past exploratory wells will be added to Map 1. The track lines of the past exploration seismic surveys can be found on Figures III.C-1 through 3 in the final seismic-survey PEA (USDOI, MMS, 2006a). Information from that document is incorporated by reference in this EIS. Printed copies of the PEA are available upon request to MMS. The PEA also is posted on the MMS Alaska Region website.

NAEC 011-008

Additional text discussing the potential impacts of contaminants has been incorporated in Section V.C.8.

NAEC 011-009

The evolution of the "Special Interest Sale" into the wider area of Lease Sale 193 is documented in Section I.D, Prelease Process of the EIS. This extensive EIS that examines the entire area is the result of that evolution. This comment states the rationale and reviewer's preferred outcome of the option the Secretary may select for the lease sale, and it is noted for the record.

NAEC 011-010

Because ANILCA does not apply to the U.S. OCS, MMS has no trust *responsibilities* for fish or other wildlife; nevertheless, MMS takes very seriously its trust *relationship* to these resources and to tribes. The MMS pioneered the first environmental justice analysis for the State of Alaska, based on the Alaskan

Native subsistence provisions of Executive Order 12898 and continues to work closely with the USEPA to improve and expand this analysis. We believe the environmental justice analyses for lease sale and cumulative impacts address all pertinent concerns.

Mitigation required for seismic survey disturbances to marine mammals is an ongoing collaboration between NMFS and MMS and will continue to be so, as both agencies have overlapping resources and permitting responsibilities.

The MMS stipulations and required mitigation and conflict avoidance measures under IHA requirements, as defined by NMFS and FWS, that directly impact subsistence activities are followed in locations where the subsistence hunt is affected. The IHA requirements obligate operators to demonstrate no unmitigable adverse impacts on subsistence practices. Conflict avoidance agreements (CAA's) between permittees, the AEWC, and village Whaling Captains' Associations work toward avoiding unreasonable conflicts and disturbances to hunters and bowhead whales. Such CAA's would follow protocols similar to those reached annually between permittees and the AEWC for the subsistence bowhead hunt and address industry seismic and drilling activities under provisions of the MMPA. With the use of the CAA methodology, subsistence-whale hunters generally have been successful in their annual whale harvest. A CAA generally includes prohibitions on conducting oil-industry activities during the bowhead whale hunting season, dispute resolution, and emergency assistance to whalers at sea. Implementation of this CAA ensures that there will no unmitigable adverse impacts on the subsistence uses of marine mammals by these residents.

NAEC 011-011

We disagree that MMS fails to meet its trust responsibilities in this EIS. The Scoping Report and Section VI of the EIS describes the extensive consultation with Native Alaska Tribes, communities, and other agencies, including NMFS, that took place throughout the development of the EIS and will continue to take place in the future. The MMS has analyzed a reasonable range of alternatives on resources within the Sale 193 area in this EIS, including subsistence-harvest resources. See response to comment NAEC 011-010 regarding our trust relationship with Native Alaskan Tribes. Mitigation measures for seismic surveys are considered in relationship to the activity and its effects, not in terms of whether those activities are conducted under a geophysical and geological permit issued under 30 CFR 251 or conducted under an OCS plan submitted and approved under the provisions of 30 CFR 250. However, as noted by ITL No. 6 - Information on Seismic Survey Activity, these are standard mitigations that apply to operations conducted under the provisions either set of regulations.

Document 012

Shell Exploration & Production Company

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December 26, 2006

VIA EMAIL: AKEIS@mms.gov

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Dear Mr. Goll:

SUBJECT: COMMENTS ON DRAFT EIS ON PROPOSED CHUKCHI SEA LEASE SALE 193 INCLUDED IN THE 5-YEAR PROGRAM, 2002–2007

Shell E&P Company (Shell) is pleased to respond to your request for comments on the draft environmental impact statement (DEIS) for the proposed Chukchi Sea Lease Sale 193 included in the 5-Year Program, 2002-2007. Shell holds a total of 103 leases in the Outer Continental Shell of the Beaufort Sea and is interested in participating in Lease Sale 193 in the Chukchi Sea.

Shell is an integrated oil and gas company addressing the challenge of meeting growing world demand for energy. We do it efficiently, profitably and responsibly - putting sustainability, the search for viable new energy sources, and the application of innovative technologies at the heart of how we do business. When Shell enters an area to explore and ultimately set up operations, we do so with a clear business objective, but we also have two other goals – to protect and preserve the environment and to make a positive impact on the community, such as through workforce development. We are committed to maintaining long-term and sustainable relationships with the state of Alaska and its residents.

Shell supports *The Proposed Action (Alternative I) under DEIS to conduct Chukchi Sea OCS Lease Sale 193 in 2007* and endorses the comments submitted by the American Petroleum Institute (API) and the National Oceans Industry Association (NOIA) on this DEIS.

5-Year Program. Shell urges the MMS to make every effort to hold the lease sale in this current 5-Year Program. We are encouraged that MMS has proposed to include the Chukchi Sea in the next 5-Year Program. As the 2007-2012 program is developed, it will define the shape and scope of domestic offshore energy development opportunities and determine the extent to which the Nation is committed to addressing its growing energy supply problems. It will serve as the foundation for significant investment in jobs, technology, and infrastructure throughout

the nation and will have a substantial effect on the state of Alaska. A robust plan could serve as the catalyst for significant revenue streams into the federal treasury and to coastal states, like Alaska, and for conservation programs. It will guide the development of domestic energy reserves to fuel our economy. Most importantly, however, the new 5-Year Program will determine how, and from what sources, our crucial energy needs will be met, and Alaska offshore waters hold great promise for meeting our energy needs.

Revenue Sharing. As indicated in earlier comments to MMS, Shell strongly and publicly advocates OCS revenue sharing of royalties, bonus bids, and fees with coastal states and communities while advocating the continuance of existing financial leasing and production terms. Such funding would protect the nation's energy supply by contributing to the economic and environmental stability of communities that support the activities necessary to ensure energy production, supply and distribution. Shell believes that revenue sharing is the best way for the federal government to acknowledge the contribution states make to our nation's energy needs. This should include Alaska. We believe it is the right thing to do.

Our support for revenue sharing has been expressed through public speeches made by Shell executives around the country, through oral and written testimony to the House and Senate, and through our sponsorship of a series of *Congressional Quarterly* Summits on Energy Exploration held this past year in communities around the country.

Shell believes a portion of OCS revenues should be specifically dedicated (not subject to annual appropriations) to MMS, Bureau of Land Management, and state wildlife management agencies to fund environmental work necessary to support oil and gas development and to fund monitoring, mitigation and enforcement activities.

Seismic Operations. We are encouraged that the MMS is partnering with the National Marine Fisheries Service (NMFS) to conduct a Seismic Programmatic EIS. We greatly appreciate the hard work and attention given by NMFS and MMS staff to expedite the environmental work and issuance of permits this past year to enable our 2006 seismic operations. We equally appreciate the current effort by both NMFS and MMS to prepare the Programmatic EIS. We believe this is the right approach to satisfy stakeholder concerns that the scientific information has been considered and the impacts and mitigation measures properly evaluated. MMS should clarify that the Chukchi Lease Sale EIS will cover all exploratory activities and will tier off of the Seismic Programmatic EIS for seismic activities.

After careful review of the available scientific information and consultation with the scientific community, the Alaska Eskimo Whaling Commission (AEWC), and the North Slope Borough, Shell developed a Conflict Avoidance Agreement (CAA) for our operations this past year, which minimized the potential effects of our seismic operations on subsistence activities. Furthermore, our marine mammal monitoring and mitigation plan was implemented to prevent physical harm to marine mammals, and our operations had no discernable impacts to the health of the bowhead whale population or other marine mammal stocks. MMS should carefully distinguish between biological effects on marine mammals from exploratory activities and the effects on subsistence

hunting. The CAA is designed to avoid conflict with subsistence hunting. In the past, we feel that this line has been blurred.

While we believe that NMFS and MMS met their obligations under NEPA in issuing the 2006 seismic permits, we are very concerned that some of the mitigations mandated by NMFS and MMS 1) were not substantiated by the available science; 2) make it very difficult at best, and in some cases unsafe or impossible, to implement seismic surveys; and 3) will potentially set unjustified precedent that will negatively impact seismic acquisition and other responsibly conducted marine based operations in the Alaskan OCS, as well as in other areas of the U.S. and worldwide. In so doing, NMFS and MMS went beyond the NEPA requirements and included alternatives (i.e., a 120-decibel monitoring safety zone) that are not implementable. We strongly urge MMS in this EIS to only consider alternatives that are implementable and to remain consistent with the purposes of the Outer Continental Shelf Lands Act. *See* 43 U.S.C. 1332 (MMS must balance protection of the human and marine environment).

Fortunately, SEPCo completed its most critical seismic data acquisition in the Chukchi Sea prior to the September 25th trigger date for the 120-decibel monitoring requirement and ceased seismic operations in the Chukchi before this deadline. SEPCo did not attempt to acquire seismic in the Chukchi after September 25th because of concerns about human safety associated with the very extensive aerial operations far from the coast that would have been required to comply with the 120-decibel monitoring under the 2006 seismic permits as set out by MMS and NMFS.

Environmental Effects. Section III of the DEIS, Description of the Affected Area, is a very thorough description of the physical and biological environment. The species-by-species breakdown with the key life history information is excellent and provides a very strong background for decision-making and mitigation planning. We are pleased that MMS has considered "Traditional Knowledge" in this DEIS. MMS should carefully consider the observations and concerns from traditional knowledge and apply the proper scientific lens to these learnings. MMS should clarify in this EIS that NEPA requires a scientific approach and not conjecture.

Shell is concerned by statements in the DEIS that oil spill response in ice conditions is known to be ineffective. The Oil Pollution Act of 1990 and attendant regulations (i.e., MMS regulations at 30 CFR 254) require that equipment be under contract to remove a worst case discharge of oil. In fact, there are techniques and strategies that have been shown to remove oil in ice conditions. Please refer to the Oil Discharge Prevention and Contingency Plan submitted by Shell to MMS for 2007 Beaufort Sea Drilling Operations. In this plan, we detail how we will respond to a spill in freeze up conditions. The DEIS should also describe the ongoing research and development, some funded by MMS, to improve our spill response capabilities.

012-001

Section V of the DEIS discusses cumulative impacts and provides a good summary of a very lengthy and sometimes confusing analysis. For example, on page V-36 the statement is made: "In conclusion, available data do not indicate that noise and disturbance from oil and gas exploration and development activities since the mid-1970's had a lasting population level adverse effect on bowhead whales. Data indicate that bowhead whales are robust, increasing in

abundance, and have been approaching (or have reached) the lower limit of their historic population size at the same time that oil and gas exploration activities have been occurring in the Beaufort Sea and, to a lesser extent, the Chukchi Sea." We urge MMS to ensure that the EIS is written and arranged to clearly support these conclusions in order to be fully defensible.

Socio-economic Effects. The mitigation measures proposed in this DEIS are quite comprehensive and cover most key aspects of the Chukchi Sea environment and the socio-cultural aspects of the local inhabitants. The description of the villages, with details of their subsistence requirements, is excellent and provides details on seasonality, species of primary interest, and the importance of the various species in the overall needs of their people. The discussions also do a good job of summarizing the other important aspects of subsistence beyond the obvious benefit of food, clothing, etc. Cultural aspects are well summarized.

The EIS should fully evaluate the socio-economic effects and benefits of exploration and development of Chukchi Sea leases on the local communities, boroughs, and the State of Alaska. The evaluation should include the benefits of job creation, tax revenue from onshore facilities, electrical power generation from natural gas supplies, and potential Federal revenue sharing. We believe that new offshore leasing would produce substantial positive effects on local communities.

012-002

We greatly appreciate the opportunity to provide these comments on the Chukchi DEIS. Please call Kent Satterlee at (985) 624-9834 if there are any questions regarding these comments.

Yours very truly,

Rob Ryan

MMS Responses to Shell's Comments

Shell 012-001

This comment identifies the lease sale options that Shell prefers the Secretary of the Interior to select. As such, it is not a substantive comment in the context of the EIS analysis, but is noted for the record.

Shell 012-002

Section IV.C.1.k(1)(a), Economy, explains the economic effects that may result from activities assumed to occur under the hypothetical scenario, including changes in employment and public revenue. Section IV.C.1m(4), Sociocultural Systems, addresses effects from routine activities assumed under the scenario on Chukchi Sea communities and the North Slope Borough. Economic effects to the Borough revenues in the context of total activity are presented in Sections V.C.11.b, Economy, Cumulative Effects on State and Local Revenues, and V.C.13.c, Sociocultural Effects, North Slope Borough revenues. The project-related property taxes would moderate the decline in Borough revenues that is occurring. Natural gas production is not reasonably foreseeable in the near future and is not an activity assumed under the hypothetical scenario. Any statement in the EIS regarding the effect of gas production on electrical generation would be purely speculative. See also Section IV.C.1.p., Environmental Justice, especially Section IV.C.1.p(4), Standard, Potential, and Ongoing Studies and Mitigation Initiatives.

Document 13 is found in the Federal and State Agency Comment Letter s Section

Document 014

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December 21, 2006

Mr. John Goll
Regional Director, Alaska OCS Region
Minerals Management Service
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503–5820

Comments re DEIS (OCS EIS/EA MMS 2006–060)
Chukchi Sea Planning Area Oil and Gas Lease Sale 193

Via E-Mail to: AKEIS@mms.gov

Dear Mr. Goll:

The American Petroleum Institute ("API"), and the National Ocean Industries Association ("NOIA") are pleased to submit these comments to Minerals Management Service ("MMS") in support of The Proposed Action (Alternative I) under the captioned Draft Environmental Impact Statement ("DEIS") to conduct Chukchi Sea OCS Lease Sale 193 in 2007. Our organizations represent more than 400 companies that are involved in various aspects of the geophysical, oil and natural gas exploration, production and service industries, and we are committed to continuing to supply the energy that American consumers and businesses rely on to keep our economy growing. Because of the importance of offshore oil and natural gas resources to our nation's economy, API and NOIA members have a direct interest in the decision to hold Lease Sale 193 in 2007 as scheduled.

Our general comments in support of Lease Sale 193 and to portions of the DEIS are found in this letter. More detailed comments with respect to particular sections of the DEIS are provided on the attachment.

The OCS is intended to meet many uses that sustain the nation, including minerals development, fishing, shipping and other uses. However, the Outer Continental Shelf Lands Act (OCSLA) explicitly recognizes the importance of OCS oil and natural gas production. OCSLA declares that it is

> "...the policy of the United States that ...the Outer Continental Shelf is a vital national resource reserve held by the Federal Government for the public, which should be made available for expeditious and orderly development, subject to environmental safeguards, in a manner which is consistent with the maintenance of competition and other national needs."

Further, amendments to OCSLA in 1978 found that "increasing reliance on imported oil is not inevitable, but is rather subject to significant reduction by increasing the development of domestic sources of energy supplies." Congress amended OCSLA at that time to achieve the "expedited exploration and development of the Outer Continental Shelf...to reduce dependence on foreign sources [.]" 43 U.S.C. Section 1802(1).

The OCS is a vital part of the nation's energy infrastructure, but virtually all of the oil and natural gas produced from the OCS is from the Central and Western sections of the Gulf of Mexico. In 2004 (the

latest year for statistics), the Gulf of Mexico OCS contributed 27 percent of the oil produced in the United States and 21 percent of domestic natural gas production. Limits on development (through Congressional and administrative moratoria) have prevented exploration and production in most of the Eastern Gulf of Mexico and the entire Atlantic and Pacific OCS. That means almost 90 percent of the OCS acreage off the lower 48 states is "off limits" to energy development. According to MMS's' recent OCS Inventory report to Congress (February 2006), there are about 288 Tcf of natural gas and 59 billion barrels of oil yet to be discovered on the OCS off the lower-48 states. This is enough oil to maintain current oil production (based on 2004 data) for 105 years and current natural gas production for 71 years. Put another way, that is enough oil to produce gasoline for 132 million cars *and* heating oil for 54 million homes for 15 years. It is enough oil to replace current imports from the Persian Gulf for 59 years. And, that is enough natural gas to heat 72 million homes for 60 years, *or* to supply current industrial and commercial needs for 28 years *or* to supply current electricity generating needs for 53 years.

That is before the Alaska OCS is considered with additional resources of 132 Tcf of natural gas and over 26 billion barrels of oil. Thus, the undiscovered resources on the federal OCS that could be recovered with *today's* technology are estimated at 420 Tcf of natural gas and almost 86 billion barrels of oil. That is equivalent to three times the oil resources of Canada and Mexico combined and almost 6 times the natural gas resources of these two countries. Yet, these estimates may be conservative since these areas are largely unexplored. In addition, these estimates would benefit from the use of new seismic and computer modeling technology. Generally, the more an area is explored, the more its resource estimates grow. For example, the U.S. Geological Survey (USGS) estimates of undiscovered oil resources for the Central and Western Gulf of Mexico increased from 6.32 billion barrels of oil in 1995 to 33.39 billion barrels of oil in 2003 – an increase of more than 400 percent. USGS estimates of undiscovered natural gas resources in the Central and Western Gulf of Mexico increased from 88.1 Tcf to 180.2 Tcf over the same time period – an increase of 104 percent.

These facts underscore the importance of proceeding with the orderly completion of the OCSLA lease sale process for proposed Chukchi Lease Sale 193. In the years since the last lease sale offering tracts on the Alaskan OCS, the oil and natural gas industry has continued to advance and refine technologies and operating practices for exploration and production in the neararctic offshore, notably in waters off Russia and Norway. Other improvements in technology and experience have accompanied the industry's efforts to meet the growing worldwide demand for hydrocarbon energy with exploration and production in the Gulf of Mexico Deep Water area, and off the coasts of such far flung locations as West Africa, Brazil, and Western Australia. At the same time, the U.S. industry in particular has continued to gain knowledge in cold weather and Arctic region operations on the Alaska North Slope, increasing its knowledge of the sensitive Arctic receiving environment – and in a considerable number of instances contributing directly to the advancement of that knowledge through industry sponsored projects and research. The industry has also worked conscientiously to increase its outreach to stakeholders who share an interest in the Arctic as a sustainable environment not simply for important energy resources, but for a way of life.

Energy demand is rising. Despite expected energy efficiency improvements of 37 percent and renewable energy supply increases of 57 percent, the U.S. Energy Information Administration (EIA) forecasts that, by 2030, petroleum demand will increase by 34 percent and natural gas demand by 20 percent. EIA also estimates that oil and natural gas will provide 60 percent of the energy consumed in 2030. MMS and DOE forecast that without expanded access beyond the Central and Western Gulf of Mexico, the growth in production will not be able to offset declines in established mature areas for more than a few years. The MMS forecast for 2004 through 2013 shows that there will be declining production of natural gas in 2006 and for oil in 2007, thus illustrating the sense of urgency for the industry to acquire access to new supply. There is no question that increased access to new energy supplies must be a part of a comprehensive approach to our growing energy demand. We need common sense energy policies that provide access to conventional energy supplies, encourage energy efficiency, and promote continued development of new energy technologies. Common sense dictates that increasing our ability to produce energy from American resources must be part of the mix. The Chukchi Sea Planning Area presents a challenging frontier and a

potentially significant opportunity for new energy resources to meet this growing demand. API and NOIA fully support Alternative I for Chukchi Sea Lease Sale 193.

The DEIS is thorough, and in general capably documented, and overall provides a good evaluation of the potential impacts of the proposed lease sale. It includes all the elements required under the various statutes cited, including the National Environmental Policy Act ("NEPA"), but at over 1,100 pages in length, it is not clear that it achieves the stated MMS objective of being "concise, reader-friendly, and useful analysis of potential effects and impacts of proposed activities". The factors that have contributed to the length and heft of environmental documents are well-known, but it must be acknowledged that a document of the size of this DEIS taxes the capabilities of all parties that share an interest in open and effective decision-making with respect to federally managed resources. Much repetition may be found throughout the EIS in subject areas such as certain mitigation measures or the effects of oil spills. The length of this document could be reduced, and its utility and readability improved, with a well-managed effort to search for and to eliminate repetitive text

014-001

The mitigation measures described in the DEIS for the Chukchi are quite comprehensive and cover most key aspects of the Chukchi environment, along with the economic, socio-cultural, and subsistence concerns of the inhabitants of the region. Section III of the DEIS, Description of the Affected Area, is a very thorough description of the physical and biological environment, including useful information about the species present in the region. The village by village descriptions, with details of the subsistence uses of the residents provides details on seasonality, species of primary interest, and the importance of the various species in the overall needs of the residents, and recognizes the other important aspects of subsistence to their culture and communal life. In Section IV, the EIS describes "significance thresholds" for a range of environmental disturbances that provides a useful baseline for future comparisons and agency decision-making. However, environmental effects sections of the report are extremely detailed, and in most cases ultra conservative. To readers not familiar with the energy industry operations and technologies, the receiving environment, and the scientific literature, it may be difficult to distinguish real issues from those that have such a low probability that they may not merit the same consideration.

The National Marine Fisheries Service has been working for several years to develop a new set of acoustic criteria for the management of marine mammals. The final version of their study was to be released at the annual meeting of the Acoustical Society of America (Nov. 28 thru Dec. 2, 2006) in Honolulu, Hawaii. If available, the new criteria, and acceptable received levels for different species, should be in the final EIS with an appropriate citation.

014-002

There is little mention of the Conflict Avoidance Agreement ("CAA") that MMS requires to be executed between operators and the Alaska Native communities in the region of planned exploration activities. To enable readers of the DEIS to understand the significance of these agreements, the DEIS should provide an explanation of CAA requirements, and a complete copy of a standard CAA should be added to the Appendices for the document.

014-003

Scientific references should be included to support the conclusions found in the section on water quality impacts from oil spills. Scientific information on water quality impacts derived from the Exxon Valdez tanker spill should be discussed in this section, in a similar fashion to what was presented for marine and coastal birds (Section IV.B.3.d) and other sections. This section should reference MMS website at http://www.mms.gov/taroilspills/ which outlines numerous projects the agency has conducted in responding to spills, both on open water and in ice.

014-004

Alaska Clean Seas (ACS) has conducted numerous training exercises over the last several years in broken ice conditions. The ACS Technical Manual, which is available on their web site at www.alaskacleanseas.org , provides numerous tactics that can be used in ice conditions. The under ice response tactics have been utilized in actual spill events. ACS has also conducted numerous projects with

In-Situ burning for use in broken ice conditions and viscous oil pumping. There is also the project with the Ground Penetrating Radar system. Most of these reports are located on the MMS web site.

The analysis of fates and effects related to oil spills needs greater support. The DEIS describes weathering processes as being "much slower than in warmer climates" but the actual citation shows the duration of oil weathering in temperatures that range from 12^0 to 28^0C. No data or discussions are provided to assess how this reduced rate of oil weathering would be expected to behave in temperatures around 0^0 C. Additional information is needed to show the likely degradation processes, especially in planning areas such as the Chukchi and Beaufort, which are described as being under sea ice for most of the year. It is important to include information in the DEIS that will be relevant to oil spill preparedness planning in the neararctic environment. The DEIS should also emphasize the paramount importance and demonstrated success of those measures taken by industry and required by MMS to prevent oil spills from occurring in the marine in neararctic operating environments, as in any environment in which the industry operates.

014-005

Some reports to reference in the DEIS include:

- A Review of the Response to Oil Spills in Various Ice Conditions: Limiting Factors and Possible Alternative Tactics, Discussion Paper; prepared for Alaska Clean Seas by S.L. Ross Environmental Research Ltd., May 5, 2000
- Oil Spills in Ice Discussion Paper, A Review of Spill Response, Ice Conditions, Oil Behavior, and Monitoring; by DF Dickins Associates Ltd, Vaudrey & Associates Inc., S.L. Ross Environmental Research Limited, August 15, 2000
- Evaluation of Cleanup Capabilities for Large Blowout Spills in The Alaskan Beaufort Sea During Periods of Broken Ice; prepared for Alaska Clean Seas and MMS; by DF Dickins Associates Ltd, Vaudrey & Associates Inc., S.L. Ross Environmental Research Limited, June 1998
- Advancing Oil Spill Response in Ice Covered Waters, prepared by DF Dickins Associates Ltd. for Prince William Sound Oil Spill Recovery Institute and the U.S. Arctic Research Commission, 2003
- Field Guide for Oil Spill Response in Arctic Waters, Emergency Prevention, Preparedness and Response (EPPR) Working Group, a Program of the Arctic Council, 1998
- Short State of the Art Report on Oil Spills in Ice-infested Waters, prepared by Johan Brandvik, Kristin Rist Sørheim, Ivar Singsaas, and Mark Reed, SINTEF, 2006

We recommend that MMS should use caution in extensive use of URL addresses for citations found in the DEIS. Web sites change all the time, and in the near future documents assigned to URL addresses may no longer be available at the cited URL addresses. Standard form literature citations should accompany URL addresses.

In conclusion, API and NOIA strongly urge MMS to adopt Alternative I for the proposed Chukchi Sea Lease Sale 193.

We thank you for the opportunity to provide these comments. Please include this letter and the attachment in the administrative record for the DEIS.

Should you have any questions, please contact Richard Ranger at 202.682.8057.

Very truly yours,

Richard Ranger
API

Kim Harb
National Ocean Industries Association

	also be barged to an onshore treatment and disposal facility located at the shore base." It is premature to determine that produced water will be reinjected. From an environmental standpoint, especially in this remote, far offshore location, there is no scientific justification for requiring reinjection. When the decision point is reached, EPA is the regulatory authority that determines what may or may not be discharged per the NPDES permitting system. Three decades of environmental studies and monitoring have shown that drill mud and cuttings discharges have *de minimis* impacts on the marine environment. MMS should not be proposing reinjection, or hauling ashore, until a proper environmental assessment has been completed. It is unreasonable to make a determination in advance without proper consideration of the environmental science, when this matter will receive thorough evaluation by EPA in exercise of its authority under the Clean Water Act. This section should be reworded, with the discharge option as one of the options that would be considered. See our comments that follow on these particular sections of the DEIS.	**014-006**
IV-17/0/1	"For the outlying subsea wells, drilling waste products could be barged to the coastal facility for treatment and disposal." Per the comments above, the outlying subsea wells would be drilled from floating structures (e.g., drill ships). At this time, a determination has not been made that discharges will be hauled ashore. Pending appropriate application under the NPDES permitting system, drill muds and cuttings (most likely water based muds), would be discharged at the site during drilling.	**014-007**
IV-18/2/1	"Shipping noise, often at source levels of 150-190 dB, since 1950 has contributed a worldwide 10- to 20-dB increase in the background noise in the sea (Acoustic Ecology Institute, 2005)." There is only one good dataset that has documented a long term rise in ambient background conditions. This was done from a hydrophone array located in deepwater off the coast of California. Due to the lack of long term, high quality background data sets, similar types of comparisons have not been done in other parts of the world. Unless it can be documented, it is inappropriate to describe overall increases in the world's oceans. The data is not there to support the claim. What is also missing in the statement made in the EIS is what frequency ranges are they talking about re: a background increase. Some frequencies have gone up over the years, others have not (e.g., lower frequencies associated with large marine transportation versus higher frequencies). Additionally, the DEIS should avoid the term "noise" in lieu of "sound". Sound is an all encompassing term that refers to any acoustic energy. Noise is a subset of sound, referring to sound unwanted by the entity that hears it. An opposite of noise is a signal: a sound containing useful or desired information. Thus, any individual sound may be a signal to some and a noise to others.	**014-008**
IV-18/4/4	"While the seismic airgun pulses are directed towards the ocean bottom, sound propagates horizontally for several kilometers (Greene and Richardson, 1988; Hall et al., 1994)." The statement is only partially correct. So that the readers are not misled,	**014-009**

	more details should be provided re: the frequency ranges see laterally. The full force of the seismic sound at low frequencies is not propagating to any significant extent laterally. There are also a range of oceanographic conditions that effect whether or not this occurs to any significant effect (i.e., mostly in warmer tropical waters with a strong near surface pyncocline).	014-009
IV-20/5/1	"Any changes in marine water quality can cause problems such as impeding or changing existing natural properties and processes, changes in flow, increased sedimentation, higher water temperature, lower dissolved oxygen, degradation of aquatic habitat structure, loss of fish and other aquatic populations, and decreased water quality." This statement is overly broad and is circular in logic. The types of changes noted above would have to be of a significant magnitude before there would be any general environmental consequence, especially in locations at a considerable distance from shore.	014-010
IV-22/3/1	"The presence of sediment in a discharge from construction or operation oil and/or gas site activities is not itself indicative of significant negative impacts to the environment." This conclusion is reasonable, but is contradictory to IV-20/5/1 above.	014-011
IV-22/6/1	"For the purpose of this assessment, compliant oil and gas operations in the foreseeable future will not have any significant impact to water quality resulting from oil- and gasfield operations sources." This statement will also be true if EPA should decide to permit discharges of drill mud, cuttings, and produced water, since such a determination would be made under the NPDES program..	014-012
IV-33/2/4	"Offshore activities also may have adverse impacts to recreation and tourism very important to other coastal areas of the country." The assessment should focus on the potential impacts to the Chukchi coastal area, and in the context of present and reasonably foreseeable activities in that region. There is simply no evidence to indicate that offshore oil and gas exploration activities have had any negative effect on coastal tourism either in the Gulf of Mexico or along the Pacific Coast where both offshore activities and a thriving coastal tourism industry may be found.	014-013
IV-34/2/5	"Declines in water quality, where they occur, are largely related to seasonal biological activity and naturally occurring processes, such as formation of surface ice, seasonal plankton blooms (occurring primarily in spring and fall), naturally occurring oil/hydrocarbon seeps, seasonal changes in water turbidity due to terrestrial runoff, and localized upwelling of cold water." Declines in water quality related to seasonal biological activity should be considered to the extent that water quality may be further impaired by oil and gas activities. For example, water temperature and ice will effect the dispersion of drill cuttings which may or may not further impair water quality declines (e.g., dissolved oxygen levels brought on by seasonal plankton blooms). However, these seasonal biological activities in and of themselves that are not related to oil and gas activity should not be considered.	014-014
IV-37/9/1	"Biocides, typically organic amines, chlorophenols, or formaldehydes, kill	014-015

	bacteria that may produce toxic hydrogen sulfide gas." Chorinated phenols have been disallowed in drilling muds for over 20 years.	
IV-38/1/1	"The presence of potentially toxic trace elements in drilling fluids and adhering to cuttings is a major water quality concern." Water based drill muds are very well known and have been studied for over 25 years. All of the key issues have been addressed by studies and research programs over the years. Basic regulations are in place to regulate all the components of concern. Toxicity tests are required to minimize and eliminate deleterious effects. Barite has a regulatory limit of 1 ppm Hg and 3 ppm Cd to assure control of trace metal contaminants. EPA would be prohibited from issuing a discharge permit under the Clean Water Act if a determination is made that these discharges would degrade water quality.	**014-016**
IV-38/2/1	"Drill cuttings are removed from drilling muds and cleaned in special separators. The amount of oil left on cuttings after cleaning is reduced, but still detectable, and has been found to be much higher when oil-based fluids are used. Separated drilling muds and cleaning fluids used to treat cuttings are partially returned to the drilling equipment circulating system." Drilling fluids are separated from the cuttings through the use of mechanical separation equipment. This is primarily through the use of different mesh size shakers, and centrifuges for the finer fractions. Special units called cuttings driers are used to help remove adhered synthetics in synthetic based mud systems. In general, cleaning fluids are not used to clean cuttings. Generally, trace levels of oil are not present in mud and cuttings until the drill bit penetrates oil bearing zones downhole. These intervals are usually fairly small, and the amount of oil entering the mud system is small. If drill cuttings are allowed for discharge under EPA permit, the drilling muds must pass an EPA required sheen test which is very sensitive to the presence of oil in the mud system. If a sheen forms (per test requirements), then the mud and cuttings cannot be discharged.	**014-017**
IV-38/2/8	"However, in all cases, drilling muds play the leading role in forming the composition of drill cuttings." The cuttings composition is determined by the strata in the well bore from which it was removed. The discharged material is characterized by drill cuttings and drilling fluids that adhere to the cuttings. It is the drilling fluids and not the cuttings that determine the effects to the environment, if any, unless the cuttings contain crude oil contamination from the geologic formation.	**014-018**
IV-38/2/14	"During the last 10 years, preference is given to using the less-toxic water-based drilling muds. However, in some cases—during drilling of deviated wells through hard rock—using oil-based fluids is still inevitable. The oil-based fluids, in contrast with the water-based ones, usually are not discharged overboard after a single application; they are regenerated and included in the technological circle. Synthetic-based muds are the third category of drilling fluids and are based on the products of chemical synthesis with ethers, esters, olefins, and polyalphaolefins (Burke and Veil, 1995)." In conditions where water based drilling fluids (also called water based	**014-019**

	muds) will do the job, they are generally preferred. But over the past 10 years, especially in deepwater and deep drilling conditions, the drill mud of preference are the synthetic based muds, which use internal olefins or esters as a base liquid. Under EPA Effluent Limitation Guidelines, synthetic drilling fluids may not be discharged, but discharge of the wetted cuttings is allowed after meeting strict limits and passing defined toxicity testing. It is unlikely that oil-based fluids would be used because neither the drilling fluid nor the cuttings that have come in contact with oil-based fluids may be legally discharged to the water.	
IV-38/3/1	"A recently developed technology to manage wastes, especially mud/drilling cuttings and produced water, allows them to be reinjected into a geological formation for disposal. This would remove and eliminate these waste streams as a potential source of water quality degradation. The exploration and development scenario presupposes that 80% of the drilling mud would be reconditioned and reused. All waste products (drilling muds, rock cuttings, and produced water) for on-platform wells would be treated and then disposed of in shallow wells on the production platform." Reinjection is one option to dispose of drilling and production wastes if a disposal well is available and if a formation can accept the materials. These options will be analyzed by EPA under the NPDES program. There are non-water quality trade offs that must be analyzed (e.g., energy consumption and air emissions) when making this evaluation. Discharges can only be authorized under the NPDES program if water quality is not unreasonably degraded. Therefore there should not be a presupposition that re-injection will be used at all drilling locations. See our comment at IV-38/2/14.	**014-020**
IV-39/0/7	"A plume typically forms whereby material may be advected short distances from the disposal site. A reduction in DO is typical as common constituents of sediments are oxidized and organic material is metabolized by microbial activity at the sediment-water interface." Reduction in interstitial DO has only been observed nearfield where cuttings associated with synthetic based muds have been deposited. Reduction in bottom DO is not normally observed in relation to regular water based muds discharge. The mud must have high organic content before measurable changes in DO occur.	**014-021**
IV-39/0/1	"The oil separators mainly remove particulate and dispersed oil, while dissolved hydrocarbons in concentrations from 20 milligrams per liter (mg/L) to greater than (>)50 mg/l go overboard as part of the discharged waters {Somerville et al., 1987; GESAMP, 1993)." The EIS should state what the EPA Effluent Limitation Guidelines are for offshore discharges of produced water (29 mg/l monthly average and 42 mg/l daily maximum). In addition to the daily maximum and monthly average, Gulf of Mexico operations require a toxicity test to determine a No Observable Effects Level (NOEC) with a surrogate test species. The discharge must be below this NOEC at the edge of the prescribed mixing zone (100 meters).	**014-022**
IV-42/0/6	"it is possible that higher quantities (~75,000 gpd) may occur as shown by past discharges." Need citation to support this number.	**014-023**

IV-41/4/1	"The USEPA has the regulatory authority to regulate industrial and municipal discharges of pollutants to surface waters in the Pacific Northwest and Alaska under NPDES. Offshore wastes from exploration activities may be discharged overboard in accordance with the NPDES general permit. Development and production activities will require an individual NPDES permit issued to the operator by the USEPA Region 10 program office, which will specifically identify discharge allowances and required operational practices for each facility covered under an individual permit." MMS has correctly stated that EPA will regulate these discharges under the Clean Water Act NPDES program. However, EPA currently has a general NPDES permit for exploration activities in the Beaufort Sea. It is reasonable to suppose that EPA would extend this general permit to the Chukchi Sea. Once production activities are proposed, the general permit can be extended to production activities, as it has in the Gulf of Mexico and other areas.	**014-024**
IV-49/0/3	"Hydrocarbon concentrations from the two estimated oil spills ≥1,000 bbl could exceed the chronic criterion of 0.015 ppm total hydrocarbons on at least several thousand square kilometers for a short time period. Concentrations above the acute criterion are not anticipated. Effects of an oil spill on water quality are expected to be low both locally and regionally." The discussion on actual hydrocarbon concentrations in the water column and in sediments from an oil spill is an excellent summary. It should be referred to in other sections that talk about potential effects of oil spills. It puts the issue in perspective.	**014-025**
IV-50/5/5	"The exploration and development scenario supposes that production slurry would be gathered on the central platform, where gas and water will be separated and the produced water reinjected. Shallow injection wells will handle these wastewaters and treated drill cuttings." The "no discharge" scenario should not be pre-determined. See our comments at IV-39/0/1	**014-026**
IV-52/3/1	"The exploration and development scenario presupposes that 80% of the drilling mud will be reconditioned and reused. All waste products (drilling mud, rock cuttings, and produce water) for on-platform wells will be treated and then disposed of in shallow wells on the production platform." See our comments at IV-38/3/1	**014-027**
IV-64/2/4	"An important aspect for this assessment of effects on lower trophic-level organisms is that the ecosystem is changing, but the changes apparently are not due to previous oil exploration, although they may be related to the consumption (burning) of oil." A more appropriate statement would be that some of the changes **may be** related to global climate changes that may in part be due to carbon dioxide emissions related to the burning of fossil fuels.	**014-028**
IV-64/6/3	"pockmark communities around methane seeps" The DEIS should cite the reference for the statement that the pock mark features observed in the offshore Chukchi Sea are caused by methane seeps.	**014-029**

IV-65/1/27	"The drilling muds probably would not kill benthic organisms, but any heavy metals in them might be accumulated by benthic organisms, adding to the body burden in vertebrate consumers. Inorganic mercury accumulated in the sediment near an old platform in the Gulf of Mexico, but the platform did not have the new USEPA limits on mercury discharges." The issue of trace metal contamination related to drill muds and cuttings has been studied in a variety of locations for over two decades. There is no evidence of trace metal uptake in benthic organisms that would either effect the exposed benthos, or that would be passed along in the food web. In only a couple of locations did the total mercury get above 1 ppm (the maximum was around 2 ppm). Methyl mercury studies were conducted at numerous locations by the American Petroleum Institute and the Offshore Operators Committee. There was no elevation of methyl mercury relative to the platforms (the bio-available form of mercury) in the sediments, nor in the biota. Additionally, NOAA/NMFS conducted platform surveys in the central/eastern Gulf of Mexico. They found that marine fish sampled had mercury levels in their tissues that were no different at the platforms than they were from natural reefs and other near shore areas sampled.	**014-030**
IV-68/3/7	"Produced water typically contains polycyclic aromatic hydrocarbons (PAH), so is toxic to organisms, and would be produced all year during production." The PAH concentrations of produced water are very low (low parts per billion), and contribute very little to toxicity. Most of the toxicity exhibited is attributed to the more volatile components, such as the benzene, xylene, toluene complex, which can range up to 10-20 ppm. Toxicity of produced water is carefully monitored and regulated under the EPA NPDES program. See our comment at IV-39/0/1.	**014-031**
IV-68/2/17	"An implication for the Chukchi Sea is that produced water might affect a 10-kilometer area around any platform during summer." This is a misleading statement since the word "affect" is not defined. Studies conducted around the world do not show elevated PAH concentrations in the water column up 5-10 km. North Sea studies are often compromised by the release of PAHs from seafloor mud and cuttings piles where significant quantities of oil based mud and diesel contaminated mud were deposted. Even if the PAHs were detectable at 5-10 km, the levels would be so low that there is no known biological effect. See our comment at IV-68/3/7.	**014-032**
IV-68/2/24	"Therefore, year-round discharges of produced water would lead to moderate local effects. However, formation water is reinjected into subsurface strata at all of the offshore Beaufort Sea developments, so we assume that produced water would be reinjected in any Chukchi Sea development." The assumption that there would be a significant nearfield increase in PAHs is speculation and has not been observed at other produced water discharge locations in the Gulf of Mexico. It is also premature to assume that offshore produced water will be reinjected in the Chukchi Sea. An NPDES permit application to the US EPA will initiate a review of technology-based limitations (please refer to the EPA Effluent Limitation Guidelines found at	**014-033**

	FR Vol. 58, No. 41, page 12454). The NPDES program also requires that water quality based limitations be applied as prescribed in the CWA §403(c) to ensure that no unreasonable degradation occurs. The evaluation will also examine non-water quality impacts (e.g., air emissions, potential for spills, etc.) associated with the different options.	
IV-70/4/8	"These agencies would make sure that the pipelines would be buried deeply enough to remain buried forever, withstanding even the ice keels that might occur only once every few hundred years after abandonment." Use of the word "forever" is inappropriate and misleading in this context. Only 12,000 years ago, the sea level was approximately 60 m lower than it is today. The ice ages have historically come every 10,000-20,000 years. The buried pipeline may be on dry land sometime in the future, in which case the permafrost conditions would dictate that the pipeline be elevated.	014-034
IV-76/2/3	"Fishes with impaired hearing may have reduced fitness, potentially making them vulnerable to predators, possibly unable to locate prey or mates, sense their acoustic environment or, in the case of vocal fishes, unable to communicate with other fishes." In a recent presentation by Popper at a marine mammal conference in Germany, Popper stated that temporary hearing impacts to fish generally don't last beyond 24 hours.	014-035
IV-77/0/1	"Seismic surveys potentially may disrupt feeding activity and displace diadromous and marine fishes (i.e., capelin, cisco, and the whitefishes) from critical summer feeding areas along the Chukchi coast." In the few instances where seismic sound has shown disruption to fish, they have been small areas with high densities of fish. Observations have shown that the fish recover quickly from the startle response and reaggregate. There is nothing in the literature to suggest a wide area response, such as the displacement of fish over a large area from a feeding ground. If there is literature to the contrary to support the hypothesis proposed here, citations should be provided.	014-036
IV77/2/1	"Most important to this issue are behavioral reactions that could result in disruption of migratory pathways or diminishing the availability of fish resources for subsistence resources (e.g., through fish abandoning important fishing grounds)." See our comment on IV-70/0/1.	014-037
IV-78/1/7	"usually due to physical excitation of the trailing edges of the blades. This can result in very high tone levels within the frequency range of fish hearing". The use of the term "physical excitation" makes this statement confusing and unclear.	014-038
IV-79/2/1	"Concurrent seismic surveys may facilitate the stranding of some schooling or aggregated arctic fishes onto coastal or insular beaches in the proposed sale area." Please provide documentation of instances where the stranding of fish as a result of seismic surveys has been observed before.	014-039

IV-80/5/8	"Based on chemical indicators of drilling muds such as barium in association with total petroleum hydrocarbons, large development projects with several wells at the same location had larger zones of detection (maximum 8,000 m) than single wells (maximum 1,000 m) at similar water depths." The statement is misleading and needs to be corrected. The only component of drilling discharges that can routinely be measured at distances much beyond 200-300 m from a discharge site is barium. Barium is a component of the mineral "barite", which is used as a weighting agent in drill muds. It is present in fairly high concentrations, and has a small particle size, usually less than 10 microns. It is not a good tracer because it does not travel with all of the other components of the drill mud. TPH, trace metals, and other components usually cannot be measured as elevated above background in the sediments beyond the 200-300 m radius. Barium (as barite), has been measured up to several thousand meters beyond the discharge point with concentrations barely above natural background. Barium being an inert and insoluble mineral, is of essentially no biological consequence.	014-040
IV-81/3/1	"Consistent zones of detection for drilling fluids and biological impacts for water-based muds were documented. Observations of the zone of detection of water-based muds suggest that average measured background levels are reached at 1,000-3,000 m. Some single-transect values have been elevated at up to 8,000 m." Other than barium, the authors should state which mud components have been verified as elevated at the distances stated. This has not been seen in other studies.	014-041
IV-81/3/7	"Biological impacts associated with the release of synthetic-based mud cuttings generally were detected at distances of 50-500 m from the well sites. Reductions in the abundance of a few species were detected over greater scales out to 1,000 m." Previously, benthic community studies have not been able to definitively show a cause and effect relationship between statistically significant changes and the presence of synthetic based mud components. Especially when suggesting biological impacts at 1000 m, more detail should be provided here, with a specific citation to the study that showed the effect.	014-042
IV-99/3/1	"**Conclusion.** The studies referenced above demonstrate that when oil contaminates natal habitats, the immediate effects in one generation may combine with delayed effects in another to increase the overall impact on the affected population, thereby causing a change in distribution and/or decrease in their abundance lasting for multiple (e.g., 3 or more) generations. The MMS reviewed the recovery status of injured fish resources tracked by the *Exxon Valdez* Oil Spill Trustee Council (Trustee Council). The Trustee Council considered recovery essentially to be "a return to conditions that would have existed had the spill not occurred" and is considered herein to equate to a return of the affected population(s) to their former status. Pacific herring, as of 2005, are not recovering; this equates to five generations since the EVOS (i.e., spring 1989). Pink salmon were listed as "not recovering" until 1997, at which time they were regarded as "recovering." Pink salmon were listed as "recovered" as of 2002, as were also sockeye salmon. Therefore, 6.5 generations passed since the spill before pink salmon were	014-043

	recovered. This information further supports the long-term effects of crude oil on herring and salmon described by Carls et al. (2005), Short et al. (2003), Peterson et al. (2003), and others noted above, as well as capturing the lingering and indirect effects of the EVOS." "Generations" should be defined as fish generations. MMS should be clear as to the applicability of these studies performed in rich fishery habitats to the Chukchi Sea.	
IV-102/4/3	"The PAH's in weathered oil contaminating such spawning sites are expected to be biologically available for long periods and very toxic to sensitive lifestages." This is a misleading statement. There are a wide range of PAH's which all have different bioactivities and toxicities depending on species and life stages. Different PAH's also have different biodegradation rates which will effect their persistence in nature. PAH's are also present at very low levels in crude oils. Some of the more active PAH's, such as BAP, are primarily from combustion processes, and not a component of crude oils.	**014-044**
IV105/1/2	"A greater separation of at least 18 mi (30 km) was recommended to prevent stranding of fish (see below), but implementation of mitigation measure 3 would provide much of the same benefits to fish." Scientific data should be cited that supports the hypotheses that fish might strand due to seismic activity, especially at distances of 30 km. We are not aware of any such findings.	**014-045**
IV-106/4/1	"For the purposes of evaluating the potential impacts of a large oil spill on fish resources, oil spill response is assumed to be ineffective due to the unpredictability of response time, proximity of the launch site(s) to fish concentration areas, known ineffectiveness of any response during certain environmental conditions (such as under ice or broken-ice)," The Draft EIS should not make overly broad statements about the "known ineffectiveness of oil spill response". The Oil Pollution Act of 1990 and attendant regulations (e.g., MMS regulations at 30 CFR 254) requires that equipment be under contract to remove a worst case discharge of oil. MMS would be precluded from issuing permits if an operator was unable to secure equipment to remove an oil spill, and the lease sale would be for naught. In fact, there are techniques and strategies to remove oil in ice conditions. Please refer to the Arctic Council EPPR Field Guide For Oil Spill Response in Arctic Waters. A large spill at sea, based on historical information, would not have a significant impact on fish populations. If the oil gets into shallow coastal waters, or into migratory streams, then some impacts to fish would be expected. See earlier discussions in the Draft EIS at IV-49/0/3 regarding the concentrations of oil expected in the water column in vicinity of a large oil spill offshore.	**014-046**
IV-107/2/1	"Airgun emissions from seismic surveys conducted in the Chukchi Sea sale area may ensonify and adversely affect Pacific salmon EFH." If there is no significant effect on the salmon, how can there be a negative effect on the Essential Fish Habitat? Either explain and provide citations, or remove.	**014-047**

IV-108/5/1	"The following analysis discusses the chance that a large oil spill from the proposed Chukchi Sea lease sale area would contact areas containing EFH." With the EFH extending out to the 200 mile EEZ, it is hard to find any area in the proposed sale that would not be in the EFH!	014-048
IV-118/1/7	"The fact that they are hunted also may heighten their response to oil and gas noise and disturbance, at least in some instances." This is speculation and not based in fact.	014-049
IV-118/2/7	"However, it is clear that this population has continued to recover, despite previous activities that caused disturbance and lethal take." The DEIS should consider the circumstance of the recovery of this population in the context of many years of seismic and drilling activity in both the Chukchi and Beaufort, accompanied decades of subsistence hunting.	014-050
IV-122/4/3	"National Resources Defense Council (1999, 2005);" Should be "Natural Resources Defense Council.	014-051
IV-124/0/8	"In addition, we make assumptions that sound will travel the maximums observed elsewhere, rather than minimums." Although this is a conservative approach, it is often an unrealistic approach. For example, low frequency sounds (e.g., < 20 Hz), especially if introduced into the deep sound channel, can travel up to several thousand km. Even thought that occurs, does it have any significance?	014-052
IV-128/1/14	"In addition, we make assumptions that sound will travel the maximums observed elsewhere, rather than minimums. This assumption may overestimate potential effects in many cases; however, since at least some of the airgun arrays being proposed for use in the Chukchi Sea have greater total output than many of those in previous studies, we may also underestimate impact in some cases." Assumptions of this sort should be avoided in a document such as this DEIS, particularly since the mitigation measures being required include a real time, in the field measurement of the sound field from the airguns.	014-053
IV-129/0/4	"During monitoring using passive acoustics in the mid-Atlantic Ocean, Nieukirk et al. (2004) frequently recorded sounds from seismic airguns from locations more than 3,000 km from their array of autonomous hydrophones moored near the mid-Atlantic Ridge." Additional description should be provided so that the reader has some feeling for how low the detected sound levels are. Just because they can be detected does not mean that they have any biological significance to animals.	014-054
IV-133/1/7	"The studies were not designed to show whether more subtle reactions are occurring that can displace the migration corridor, so no definitive conclusions can be drawn from them on whether or not the overall fall migration is displaced by seismic activity." Please include this statement in the conclusions.	014-055
IV-133/2/12	"The axis of the bowhead migratory route near Barrow was found to fall	014-056

	between 18 and 30 km (7.76 and 18.6 mi) from shore." Please state the basis for this determination, whether from research, monitoring, or some other means. It does not appear possible to make a "random sighting from shore" and be reporting an axis for the migratory route that stretches out 18.6 miles (i.e., beyond the line of sight to the horizon).	
IV-145/1/4	"most "fleeing" reactions in mammals area accompanied by endocrine changes, which, depending on other stressors to which the individual is exposed, could contribute to a potentially adverse effect on health." Please provide a citation or reference for observing or determining the existence of such endocrine changes in bowheads, and their significance to the health of an animal that may experience them.	014-057
IV-165/2/2	"In most cases, drilling mud is recycled in the development drilling program. All waste products (e.g. drilling mud, rock cuttings, and produced water) for on-platform wells are treated and then disposed of in shallow wells on the production platform. For the surrounding subsea wells, drilling waste products could be barged to a coastal facility for treatment and disposal." Please see our comments at IV-38/3/1	014-058
IV-168/4/7	"reduced food source;" There is no good evidence that there have been massive zooplankton kills beneath oil spills (if information to the contrary exists, citations should be provided). In addition, the overall area where effects might occur would be small compared to the area available for feeding. A temporary loss of an area for feeding would have questionable impacts on the bowhead, as they are thought to go a significant portion of the year with minimal feeding.	014-059
IV-173/4/8	"Particularly in nearshore habitats where vertical migration of copepods is inhibited due to shallow depths and geographical enclosure, phototoxicity could cause mass mortality in the local plankton population. (Duesterloh, Short, and Barron, 2002)." Significant increase in toxicity and mortality in the open ocean is hypothetical, and in the scenario presented here, how shallow is shallow. Large baleen whales have a limitation on how shallow they will go and still actively be in a feeding mode.	014-060
IV-181/0/17	"However, loss of feeding efficiency could potentially reduce the chance of survival of any whale and could affect the amount of energy female whales have to invest in reproduction." This is a broad speculation. Factors such as the condition of the whale when exposed (i.e., whether or not it had been feeding and built up food reserves), and the duration of the decrease in feeding efficiency, would all determine whether or not the effects would be significant. It is already known that the whales (different depending on age, reproductive status, etc.) go significant periods of time with minimal feeding.	014-061
IV-182/3/2	"Seismic surveys could have a variety of potential impacts to marine birds from the physical presence and noise produced by vessels, sound produced	014-062

	by the seismic airguns," Citations should be provided that show seismic sounds have effects on marine seabirds.	
IV-184/1/4	"However, there may be effects that were too subtle to be detected by this study." This appears to be speculative. It is also possible that there were simply no effects.	014-063
IV-185/4/2	"High-intensity lights are needed during the seismic surveys to help spot marine mammals during nighttime operations or when visibility is hampered by rain or fog." High intensity lights are not required, and generally not used to look for marine mammals during night time seismic operations.	014-064
IV-198/3/1	"Oil activity also may result in increasing contamination of marine habitats due to the disposal of drilling muds and cuttings, or accidental eruption of oil from test wells during a blowout." The nature of drill muds and cuttings discharges, and their fate in the marine environment, making interaction and impacts on marine seabirds highly unlikely.	014-065
IV-210/2/1	"Raptors may extend their range if they were able to nest on oil-development and -transportation structures. While this range expansion may benefit raptors, it likely would have a net negative impact on other marine and coastal birds because these birds would suffer increased predation." There have been onshore and offshore oil field related structures all over the world in areas with a wide range of raptors. If there is any literature documenting that they use these structures for nesting, then they should be cited. In Prudhoe Bay, Cook Inlet, and throughout the Gulf of Mexico, there hasn't been an issue of raptors trying to nest on structures.	014-066
IV-211/3/5	"Because of the lack of data on which to base informed decisions, it is unknown if noise introduced into the environment from industrial activities, including drilling and seismic operations, will have an adverse impact on nonendangered and nonthreatened marine mammals in the Proposed Action area." Based on the considerable information we have on these animals from other areas, and with the mitigation measures to be required, there is a high probability that the impacts would be minimal. The above statement also makes it very clear that there should be significantly more money put into the MMS Environmental Studies Program, and into the NMFS marine mammal studies program, so that adequate environmental data is available to support the policy decision to facilitate exploration for new energy resources in the OCS.	014-067
IV-211/3/8	"Increasing vessel traffic in the Northwest Passage, which includes the Proposed Action area, increases the risks of oil and fuel spills and vessel strikes of marine mammals." Please state the geographical location of the Northwest Passage as it is	014-068

	relevant to this DEIS.	
IV-212/2/2	"Disturbance may cause seals to leave haulout locations and enter the water." The areas currently being considered for seismic work in the Chukchi are no where near any pinnipeds haul out areas. Seismic will generally not be conducted if there is ice in the area which would impede their progress, make turns difficult, and that might introduce unwanted sound into the water column.	**014-069**
IV-213/1/4	"longer (i.e., auditory and/or vestibular harm that lasts months or even years)." The literature does not suggest that there is long term damage to marine fish ears and hearing. Citations should be provided to support this statement in the EIS.	**014-070**
IV-214/3/25	"Potential effects of prolonged or repeated disturbance include displacement from preferred feeding areas, increased stress levels, increased energy expenditure, masking of communication, and the impairment of thermoregulation of neonates that are forced to spend too much time in the water (Garlich-Miller, 2006, pers. commun.)." Please provide citations of"increased stress levels" in walrus and masking of communications. What was the scientific or research basis for such a determination?	**014-071**
IV-218/3/3	"As previously discussed in the USDOI, MMS (2006a:Sec. III.F.1), direct and adverse impacts affecting some prey species (i.e., some teleost fishes) may last for days to weeks (e.g., displacement from foraging, staging, or spawning-habitat areas) or longer (i.e., auditory and/or vestibular harm that lasts months or even years)." Citations should be provided for any studies that document displacement of fish aggregations for weeks and longer due to seismic surveys. Most studies show that the displacement is on orders of hours to a day or so.	**014-072**
IV-219/0/2	"In 2004, the IWC Scientific Committee's Standing Working Group on Environmental Concerns reviewed information related to the stranding of eight adult humpback whales in Brazilian waters during the 2002 breeding season that occurred while seismic surveys were operating in the immediate area. No clear cause of the stranding was ever found, but the IWC as a whole and its Scientific Committee agreed that there is compelling evidence of increasing sound levels having the potential to impact whales." The same authors essentially recanted their previous publication in a paper given at the 2006 IWC meeting. This citation, and the correction on their earlier conclusions, should be quoted and cited here.	**014-073**
IV-223/5/12	"One possible explanation is that these animals are more used to industrial noise and heavy traffic and, thus, are habituated to it. Conversely, they might be hearing impaired due to ongoing noise exposure (Erbe and Farmer, 2000) and, thus, desensitized." Please also include the explanation the sound does not bother them at all, and they ignore it. In the absence of data showing otherwise, this is the most	**014-074**

	plausible explanation.	
IV-233/2/1	"In light of the uncertainty over the potential impacts of exploration and development activities, the earliest possible establishment of long-term monitoring programs for vulnerable species in the project area should be pursued. The design of long-term monitoring should take into account the likely size of any effect and the probability of detecting it within a reasonable time span (IWC, 2006)." Please discuss the funding options for these studies.	014-075
IV-234/2/10	"As vividly demonstrated by these events, small, chronic leaks in underwater pipelines could result in large volumes of oil being released underwater and under the ice cover without detection." It is inappropriate to compare the potential for leak volumes for an offshore flow line with those from an onshore 48" transport line. Additionally, there are leak detection technologies available to detect very small pipeline leaks, and technologies are emerging to detect oil under ice.	014-076
IV-268/5/1	"For exploration wells, because of the high cost of synthetic drilling fluids now commonly used, it is assumed that 80% of the drilling mud will be reconditioned and reused. Only 20% (an estimated 95 tons) of "spent mud" per well will be discharged at the exploration site." The discharge of synthetic drilling fluids is prohibited by EPA Effluent Limitation Guidelines. The synthetic fluids, like water based fluids, are recycled on board. The solids are removed, and the fluids are continually recirculated back down the hole. In the case of synthetics, only the cuttings, with a regulated percentage of adhering synthetics, are discharged to the sea. In the case of water based muds, toxicity and discharge rates are controlled, but mud is allowed for discharge to the sea. The water base mud is still recycled on board the drilling vessel, with only a fraction of it being discharged to the ocean at any one time. See our comments at IV-38/3/1.	014-077
IV-269/0/1	"For production wells all waste products (drilling mud, rock cuttings, and produced water) for on-platform wells will be treated and then disposed of in shallow wells on the production platform. For the surrounding subsea wells, drilling waste products could be barged to a coastal facility for treatment and disposal." See our comment at IV-38/3/1.	014-078
IV-271/1/1	"Beluga whales are sensitive to noise and may be displaced from traditional harvest areas by heavy boat traffic or seismic survey noise. This disturbance response, even if brief, might temporarily interrupt the movements of belugas or temporarily displace some animals when the vessels pass through an area." In the near shore areas where belugas may be hunted by local communities, there would be operational restrictions and minimal industry traffic. In the offshore lease areas, their distance offshore is beyond where native groups would usually hunt for belugas.	014-079
IV-272/3/1	"The impacts of noise and disturbance in offshore areas on fish harvests likely would be minimal, although the increased noise potential of four concurrent seismic surveys (especially ocean-bottom-cable surveys in	014-080

	shallower waters nearshore) could displace and disturb fish migrations and distributions and potentially "herd" them away from traditional subsistence-fishing areas (see Sec. IV.C.1.d, Fish Resources; Braund and Burnham, 1984; USDOI, MMS, 1987d, 1990b, 1995a)." With limited fishing in the Chukchi region, and the operations being relatively far offshore, there is no existing information that would suggest that near shore fisheries or migrations would suffer any changes or impacts from the far offshore activities.
IV-329/6/1	"A 120-dB aerial monitoring zone for bowhead whales in the Chukchi Sea will be established and monitored: (1) once four or more migrating bowhead whale cow/calf pairs are observed at the surface during the vessel research-monitoring program; (2) once Barrow whalers notify NMFS or MMS that bowhead whale cow/calf pairs are passing Barrow; or (3) on September 25, whichever is earliest. Once notified by NMFS or MMS, a daily aerial survey will occur (weather permitting) within the area to be seismically surveyed during the next 24 hours. Whenever four or more migrating bowhead whale cow/calf pairs are observed at the surface during an aerial monitoring program, no seismic surveying shall occur within the 120-dB monitoring zone around the area where the whales were observed by aircraft, until two consecutive surveys (aerial or vessel) indicate they are no longer present within the 120-dB safety zone of seismic- surveying operations." NMFS and MMS are conducting an Arctic Seismic EIS (see FR Vol. 71, No. 222, page 66912. Therefore, this mitigation, based on the previous permits, should not be assumed. The DEIS should provide detailed data to support the necessity of a 120 dB monitoring safety zone. Studies and research that evaluate the sensitivity of cow/calf pairs relative to other the sensitivity of other classes of individuals from the same species should be discussed. If the cow/calf pairs are slightly more sensitive to sound, then they would just give the operations a wider berth on their migration south, thus keeping them actually further away from any detrimental effects of the sound. There is no data to suggest that it would stop the migration. If NMFS or MMS contemplate additional scientific research to address this issue, the PEIS should describe the scope of such research plans. Included in the discussion of the implications of the 120 dB "monitored safety zone" should be a detailed discussion of the logistics, practicality, costs, and safety considerations. The zone of 120 dB ensonification area, based on modeling and actual measurements in 2006 is greater than previously thought. This creates an extremely large area that would require several aircraft and boats to monitor. An analysis of customary prevailing weather conditions for this region should be included to put in perspective the feasibility of trying to monitor this large an area. The DEIS should discuss the suitability of using the sound pressure level threshold to express the complex relationships of physical, environmental and species-specific and other biological effects from marine sound sources and to ascertain acoustic risks to marine mammals from these sources, and

014-081

	evaluate the utility of other approaches, such as a matrix of source-specific parameters, environmental parameters, and species-specific variables, that have been considered in the literature or tested in other jurisdictions.	
IV-327/7/1	"A 180/190-dB isopleth-exclusion zone (also called a safety zone) from the seismic-survey-sound source shall be free of marine mammals before the survey can begin and must remain free of mammals during the survey." The new NMFS "acoustic criteria" will be published before this EIS goes final. A preliminary copy of the article that has been submitted to JASA by NMFS is available upon request from Brandon Southall. These new criteria should be reviewed, and included in these discussions. They may in fact change the 180/190 thresholds currently in use.	**014-082**
IV-345/9/1	"Floating drilling platforms could disturb the sea floor and buried archaeological resources by anchor-drag during the setting of anchors or movement of the drillship or support vessels over the anchor-spread area." There is no data to suggest that archaeological sites exist 20-75 miles offshore in the Chukchi.	**014-083**
IV-346/5/1	"The placement of a bottom-founded production platform may compresses Holocene sediments, releasing water and possibly biogenic gas, which could disturb the host and overlying strata, including potential prehistoric archaeological resources." Same comment as IV-345/9/1	**014-084**

MMS Responses to American Petroleum Institute Comments

API 014-001

Part of the length and repetition of the document is caused by:

- the inclusion of geophysical and geological surveys as a related action in addition to the lease sale;
- the use of the NEPA document as the vehicle for fulfillment of the consultation requirements of various laws and Executive Orders, such as Endangered Species Act, Marine Mammal Protection Act, Essential Fish Habitat, and the National Historic Preservation Act and Environmental Justice;
- the lack of similar recent NEPA analyses for the Chukchi Sea that, unlike the Beaufort Sea Lease Sale EIS/EA, do not facilitate incorporation by reference; and
- the diversity and importance of resources in the area.

API 014-002

The referenced information has not yet been released.

API 014-003

Through Lease Stipulation No. 5 – Conflict avoidance Mechanism to Protect Subsistence Whaling and other Subsistence-Harvest Activities (Sec. II.B.3.c(1)), MMS requires that OCS exploration, development, and production activities are conducted in a manner that prevents unreasonable conflicts between the oil and gas industry and subsistence activities. The MMS does not specifically require a Conflict Avoidance Agreement (CAA), however a CAA would meet the requirements of Stipulation 5.

API 014-004

Pertinent information within the Water Quality section is documented with scientific reference when appropriate. The MMS used information and data corresponding to the 1989 *Exxon Valdez* oil spill where and when it is appropriate.

The MMS appreciates the comment referencing the website at http://www.mms.gov/taroilspills/. The website has very good information on MMS's Oil Spill Response Research (OSRR) Program. Many sections relied upon information and data that can found on the MMS OSRR Program website.

API 014-005

The oil-weathering estimates were run at 2.7 °Celsius and -1 °Celsius, as discussed in the Notes on Tables A.1-9, 10 and 11 in Appendix A. The behavior and fate of crude oils is discussed in Appendix A, Section B. Specific references are given regarding how colder temperature affect spreading, dispersion, evaporation, and other properties related to the weathering of oil in ice.

API 014-006

We acknowledge that the many permitting requirements for future offshore developments are uncertain at this time. However, the scenario is based on a "no surface discharge" standard that has been established in northern Alaska. Besides the possible environmental effects avoided by subsurface injection of produced water, there are benefits for field operators. Waterflooding to maintain reservoir pressure to maximize oil recovery is a common practice for remote, high cost fields in northern Alaska. Produced water generally has chemistry compatible with the reservoir formation and, therefore, makes a good fluid to use in waterflood operations. Otherwise, expensive seawater-treatment equipment would be necessary to produce "make-up" water to fill reservoir voidage created by oil production. Many details of future field development will be proposed/reviewed/modified/approved according to site-specific conditions. We cannot analyze all possibilities in a general scenario at this early leasing stage.

API 014-007

As stated in the response to comment **API 014-006**, we agree that it is premature to strictly define the regulatory requirements for all future projects in this area. The scenario is only one plausible view, but we do attempt to be consistent with current practices for both industry and regulatory agencies. Generally speaking, the onsite discharge of muds and cuttings from a relatively small number of exploration wells has been allowed by USEPA under NPDES permits. However, for large numbers of development wells, USEPA has required either subsurface or offsite disposal. Numerous options surely will be considered prior to any drilling program, and permitted activities hopefully will balance feasibility for the operators and protection/mitigation for the environment. We cannot evaluate all possible options at this time when the location of the future development project has not been identified.

API 014-008

We have verified the statement from the cite source and believe no change is necessary. Your excellent explanation of sound versus noise has been added to the EIS at Section IV.A.3.b.

API 014-009

A section on factors affecting sound propagation has been added to Section IV.A.3.b.

API 014-010

The text has been modified to reduce the scope of the statement and remove the redundancy.

API 014-011

This comment references two statements within Section IV.A.3. The statement in Section IV.A.3.d refers to possible changes to water quality, while the statement in Section IV.A.3.d.(2) refers to changes that do not cause *significant* negative impacts. While they may be similar in nature and constituent data, they do represent two different data sets. The MMS believes that both statements are correct and appropriate.

API 014-012

The MMS agrees with the statement. No change in text is required.

API 014-013

The commenter refers to a general statement referencing conflicts of resources occurring predominantly in the continental United States. The MMS recognizes that there is not a recognized recreation and tourism industry associated with the Chukchi Sea.

API 014-014

Section IV.C.1.a(1) addresses the existing water quality; as such, the identification and discussion of seasonal biological activity and naturally occurring processes is appropriate. The scope of Section IV.C.1.a(1) is not specifically related to oil and gas operations but to the general water quality that presently exists in the Chukchi Sea.

API 014-015

The MMS agrees with the comment and has modified the text of the EIS.

API 014-016

The MMS agrees with the comment and has modified the text of the EIS.

API 014-017

The MMS agrees with the comment and has modified the text of the EIS.

API 014-018

MMS agrees with the comment and has modified the text of the EIS.

API 014-019

The MMS agrees with the comment and has modified the text of the EIS.

API 014-020

See the responses to comments **API 014-006** and **API 014-007**. We do not presuppose that any strategy will be the approved method of waste disposal. The scenario is only one hypothetical set of assumptions used to unify the environmental impact analysis. Other scenarios are plausible, but we cannot analyze them all. Future development designs and permitting requirements will be defined by site-specific conditions and regulations at the time.

API 014-021

The MMS agrees with the comment and has modified the text of the EIS.

API 014-022

The USEPA NPDES permit is referenced two sentences later in the discussion of produced waters. Specific reference to the Effluent Limitation Guidelines is not required to convey the level of detail intended within this paragraph. Any discharge that would occur from oil and gas operations within the Chukchi Sea area would have to operate under either the USEPA Authorization to Discharge under the National Pollution Discharged Elimination System (NPDES) for Oil and Gas Exploration Facilities on the Outer Continental Shelf and contiguous State Waters (AKG280000) or a USEPA issued individual NPDES permit. Reference to the Gulf of Mexico *No Observable Effects Level* is not appropriate in this situation.

API 014-023

Estimates for fluids and solids discharges are calculated using simple approximations for typical well diameters and drilled depths. All wells drilled to develop a field will not produce exactly the same volume of wastes. Also, until a field development plan is finalized, we do not know exactly how many wells will be drilled. Therefore, discharges could be higher or lower than those used for purposes of environmental impact analysis.

API 014-024

To date, MMS has not had discussions with USEPA on the development of a site-specific development NPDES permit to date. Due to the uniqueness of the Arctic, we would not presume that what is done in other regions necessarily would follow for the Arctic.

API 014-025

The MMS agrees with the statement. No change in text is required.

API 014-026

A "no discharge" is not presumed within the text; any regulated discharge that would occur from normal operations would be regulated and permitted by the USEPA. The third sentence preceding this comment statement was changed to more accurately define this condition.

API 014-027

The predominant disposal method for Beaufort Sea OCS disposal of drill muds/cuttings is for down-hole disposal in approved/permitted wells from the production platform. The last sentence in the paragraph identifies other methods that industry can use for disposal methods. This sentence has been modified to identify onsite/vessel storage of muds and cutting for proper disposal prior to identifying ultimate disposal practice.

API 014-028

The recommended change was incorporated.

API 014-029

As explained in Section II.B.1.b, reference is made to MacDonald (2002), which is OCS Study MMS 2002-036, of some methane-filled pockmarks in the Gulf of Mexico. However, we consider as speculative the suggestion in the draft EIS that pockmarks form around methane seeps, and that they might exist on the deep Chukchi slope in the proposed lease area. The information has been removed from the final EIS.

API 014-030

The commenter disagrees with the implication that heavy metals from drilling muds might be accumulated by benthic organisms, and states that there is "no" evidence of trace metal uptake in benthic organisms around drilling platforms in the Gulf of Mexico, and that there was "no" elevation of methyl mercury relative to the platforms. However, Dr. John Trefry et al. (2006) concluded that elevated concentration of methylmercury is sediments around drilling sites are not a "common phenomenon" in the Gulf of Mexico (Environ. Geol., DOI 10.1007/a00254-007-0653-6). Further, ongoing research by Dr Aixin Hou at Louisiana State University has shown that methylmercury concentrations are higher at the platforms and decrease, along with organic matter, with distance from the rigs, and that summer hypoxia in the Gulf stimulates methylmercury formation (LSU Coastal Clips, 5, 2006). No changes were made in the final EIS.

API 014-031

Text has been added to clarify the assessment of the effect of produced-water discharges on lower trophic-level organisms.

API 014-032

The text has been revised to explain that PAH might be "measurable" rather than have an effect.

API 014-033

The text has been revised to provide additional information on the NPDES Program.

API 014-034

The text has been revised to explain that the pipeline would have to remain buried "as long as the pipelines maintain integrity."

API 014-035

We agree that the effects from increased predation, inability to feed, navigate, or communicate with other fish, even if for less than 24 hours, could result in reduced fitness to fish. See Section IV.C.1.d(2)(b)1).

API 014-036

The behavioral effects on fish from seismic operations are detailed in Section IV.C.1.d(2)(b)2), Impacts to Behavior. Specific effects and cited literature are provided.

API 014-037

Disruptions to migration pathways are described in Section IV.C.1.d(2)(b)3), Impacts to Migration, Spawning, and Hatchling Survival. Conceptually, the displacement effect, if occurring close to shore, could restrict or delay fish movements. In such cases, if fish are delayed for a prolonged period or repeatedly interrupted, there is the possibility they could miss favorable conditions for migration or spawning. Our analysis concludes that any adverse effects from this potential impact for this lease sale would be temporary and localized, and only a moderate level of disturbance or displacement would occur.

API 014-038

"Physical excitation" refers to the rapid movement or vibration of the thinnest part of a blade. The main point, stated in the following sentence, is that boat propellers can generate very high tones that are within the hearing range of fish. Our analysis concluded that typical vessel noise associated with the lease sale would have a negligible impact to fish resources.

API 014-039

As stated at the beginning of the section, there is additional detail regarding the potential impacts of acoustic noise on fish in the Programmatic Environmental Assessment for Arctic Ocean Outer Continental Shelf Seismic Surveys – 2006 (USDOI, MMS, 2006a). Section III.F.1.i(2)(h) contains additional specific information and literature references regarding fish strandings by acoustic noise.

API 014-040

The intent of this statement is to describe how a cluster of several wells would have a correspondingly larger zone of detection. We recommend the reader review the original publication to more fully understand the intent of this statement. See the bibliography for the full citation for Hurley and Ellis (2004).

API 014-041

Barium was used as a tracer for these studies. See the response to comment **API 014-040** for the literature citation.

API 014-042

As stated at the beginning of this section, the primary source of information was Hurley and Ellis (2004). The full citation is included in the bibliography.

API 014-043

The definition of how we use the term “generation” in regards to significance criteria is contained in Section IV.A.1.

API 014-044

The effects of oil spills on sensitive lifestages of various fish species are described in Section IV.C.1.d(3)(d)4), Oil Spill Impacts to Fish Resources – Lessons from the *Exxon Valdez* Oil Spill. Spilled oil may persist in some coastal habitats for many years, periodically releasing PAH’s and other compounds that could have a long-term negative effect on sensitive lifestages of fish using those habitats.

API 014-045

See the response to comment **API 014-039**.

API 014-046

The MMS believes this statement is a technically accurate description of assumptions made during the impact analyses.

API 014-047

Section IV.C.1e(2), Potential Effects from 3-Dimensional Seismic Surveys on Essential Fish Habitat, concludes that only minor adverse effects would be expected to occur to marine salmon EFH, because the potential effects are localized and temporary.

API 014-048

Section IV.C.1.e(4), Potential Effects of a Large Oil Spill on Essential Fish Habitat, describes how MMS focuses on habitats most important to salmon. While we agree with the reviewer that it is possible pacific salmon could roam 200 nautical miles offshore, we clearly conclude this is not where oil-spill effects likely would occur.

API 014-049

The referenced sentence did not relate a heightened response to oil and gas noise and disturbance to a “lethal take.” The issue is discussed more fully in the section on cumulative effects, Section V.C.6.

API 014-050

The draft EIS does state in numerous locations throughout its bowhead whale analysis that this population appears to be stable or increasing, and historical use of the Beaufort and Chukchi for oil and gas activities does not appear to have inhibited the continued recovery of this population. However, it is important to note (and as stated in the draft EIS) that mechanisms were not in place over this time to directly measure for these type of impacts. Therefore, we cannot say with certainty that past and present oil and gas activities have not *affected* the bowhead population, but only that the population continues to recover despite the presence of these activities. The MMS believes no changes are needed to the EIS to address this comment.

API 014-051

The MMS agrees with the comment and has made the appropriate changes.

API 014-052

The MMS believes that this conservative approach is appropriate to the analysis of this Proposed Action. As the "deep sound channel" is a feature in the Pacific Ocean, the question posed in the comment is a hypothetical question and outside the scope of this EIS. The MMS's significance criteria for the proposed action in the Chukchi Sea Planning Area are discussed in Section IV.A.1.

API 014-053

The MMS believes that this conservative approach is appropriate to the analysis of this Proposed Action. The mitigation measures ultimately will apply only to the area determined through field verification to be the area of concern.

API 014-054

This specific sentence is part of a subsection on the discussion of potential impacts from seismic activities and is meant to summarize the results of studies and other available information on the issue. The full analysis on the potential effects to bowhead whales is contained throughout Sections IV.C.1.f(1)(b) and IV.C.1.f(1)(c) and is summarized beginning at the bottom of page IV-149 of the draft EIS. This analysis does reflect where noise may not be disturbing (and even potentially result in habituation) and where specific scenarios (i.e., impacts to cow/calf pairs or feeding aggregations) may have the potential to result in biologically significant impacts.

API 014-055

This particular statement references the discussion of studies from the 1980's and early 1990's that are covered on pages IV-129-133 of the draft EIS. The studies were not designed to determine whether more subtle reactions were occurring to alter the bowhead whale-migratory corridor. The MMS believes this statement also is not needed in the conclusion.

API 014-056

This determination is made from decades of aerial survey studies of bowhead whale migration. The distance from shore is not based on sighting an animal from shore but actually by an aerial observer sighting an animal, and then through proven and accepted methodology determining the approximate distance of that animal from shore. The statement is correct as written.

API 014-057

The MMS recognizes that there have not been any direct studies on bowhead whales to assess the physiological responses of stress. However, the connection between stress and endocrine system changes in mammals is a widely accepted biological principle. For marine mammals, it was more recently studied in Curry (1999) and Fair and Becker (2000), which have been added to the bibliography. The MMS feels it is appropriate to apply the statement referenced in the comment above to bowhead whales and no changes will be made to this statement.

API 014-058

See response to comment **API 014-020**.

API 014-059

A reference of interest would be: Populations of amphipods off the coast of France were reduced by 99.3% following the *Amoco Cadiz* oil spill in 1978 (approx 70 million gallons). Ten years after the spill, amphipod populations had recovered to only 39% of their original maximum densities (Dauvin, 1989, as cited in Highsmith and Coyle, 1993).

Please refer to page IV-173, Food Source. This section agrees with your comment on relative scale of a zooplankton kill in localized situations nearshore versus the remaining habitat available to bowheads to obtain food. It is true bowhead whales spend a considerable portion of the year with minimal feeding; however the remainder of the year is critical to locate and consume the food quality and quantity to store nutrients and energy (blubber) for the period when food is largely unavailable and still maintain critical life functions including pregnancy and energy demanding spring migration, lactation, and breeding. It is quite common in mammals that are required to tolerate a stress season in terms of food availability and quality to experience breeding and reproductive failure and at time mortality when levels of stored energy are exhausted.

API 014-060

The MMS agrees that the toxicity and mortality in the open ocean differs from the lab conditions and are hypothetical outcome. However, the implications for potential localized zooplankton mortality remains a consideration, especially when considering traditionally used high-productivity/high-use localized whale-feeding areas. There are still unknown outcomes relative to water turbidity, weather conditions, wave and tidal influences, oil age and mixing depths, and depths at which toxicity is diluted to nonmortal levels. It is unknown how these influences would modify the severity of a phototoxic mass mortality.

API 014-061

The MMS believes the statement is accurate. The Summary and Conclusions on pages IV-178-181 of the draft EIS provide for an overview of the potential range of effects that may occur from oil and gas related activities under the Proposed Action. This includes areas identified where effects are unlikely to where there is a potential for greater, and potentially significant, effects. The particular draft EIS text referenced in the response to comment API 014-059 is meant to show the potential for effects to bowhead whales if food becomes unavailable due to a large oil spill. Although the degree of effect can be influenced by such factors as age, sex, and reproductive status, the statement is meant to show the potential for a higher level of effects. In addition, it is important to note that little is known about bowhead whale feeding behavior in the Chukchi, although it is considered likely to vary between years, among individuals, and among areas. Given the level of uncertainty that exists, MMS cannot rule out the potential for oil spills in the Chukchi to affect bowhead whale feeding and ultimately bowhead whale health, reproductive status, or even survival. Again, the section as a whole provides for a range of effects, and the analysis needs to be considered as a whole.

API 014-062

The best examples of the behavioral responses to marine and coastal birds to vessel presence and noise are contained in the Biological Evaluation for Threatened and Endangered Birds (draft EIS, Appendix C, starting on page 37; now available at http://www.mms.gov/alaska/ref/Biological_opinionsevaluations.htm or from MMS). Numerous citations to scientific articles are provided in this section.

API 014-063

This section explained some of the uncertainty surrounding the results of this study. Many important disturbance effects were not or could not be evaluated for significance. Cause-effect relationships were inconclusive.

API 014-064

The use of high-intensity lights during seismic surveys is primarily to conduct safe operations on the aft deck of a vessel. The MMS and NMFS do not require their use to monitor the exclusion zone for the presence of marine mammals at night or during foggy conditions. This is because they would be more of an attractive nuisance for birds, including the threatened species Steller's eider (i.e., they would cause bird collisions with vessels and cause injuries and mortalities), than an effective tool for detecting marine mammals.

Seismic surveying requires an essentially ice-free operational environment, which means that the window for surveying is very short. Because of this, seismic surveys attempt to operate 24 hours a day, 7 days a week. Continuous operation of the airgun array is expected to deter marine mammals from entering the exclusion zone. In fact, one of the required marine mammal mitigation measures is to keep at least one airgun firing during vessel turns, when normally all the airguns would be shut off. Based on this expectation, surveying is allowed to continue into darkness or in deteriorating visibility conditions (e.g. fog) as long as the airgun array is continuing firing. If the array is shut down for any reason, ramp up to restart the survey cannot be initiated at night or when monitoring the exclusion zone is not possible, for instance when there is fog. Although visual observers are the major component of monitoring the exclusion zone, other methodologies are available for monitoring, including passive acoustic and possibly the use of aerial drones.

API 014-065

Bioaccumulation of toxic compounds via food webs could include marine birds. Direct impacts to birds from a blowout also are unlikely (and are not expected to occur), but they are possible. We believe the EIS should include all potential impact categories, regardless of how likely an effect would occur.

API 014-066

The situation has received more attention in the past decade, and some efforts have been made to study or remove raptor nests on manmade structures. Several examples of raptors nesting on oil-development facilities are included in Ritchie (1991).

Expansion of ravens onto the North Slope is mentioned in Quakenbush et al. (1995) as cited in Appendix C (now available at http://www.mms.gov/alaska/ref/Biological_opinionsevaluations.htm or from MMS).

API 014-067

If API has “considerable information” on these animals from “other areas” and can demonstrate that there is a “high probability that the impacts would be minimal,” MMS suggests that API share that specific information with MMS. Our extensive reading of the scientific literature has produced no such certainty.

We also agree that it is very clear that there should be significantly more money put into the MMS Environmental Studies Program, and into the NMFS marine mammal studies program, so that adequate environmental data is available to support the policy decision to facilitate exploration for new energy resources in the OCS.

API 014-068

The text of Section IV.C.1.h(1), Conclusion, has been modified.

API 014-069

The text in the draft EIS is correct as written.

Although "seismic generally will not be conducted if there is ice in the area that would impede their progress," smaller support vessels and aircraft still may disturb seals hauled out on ice as they transit through the area.

API 014-070

This statement was made based on consultations with our former fisheries biologist. The following citation has been added to this statement (Jeff Childs, pers. comm.).

API 014-071

This statement discusses "potential effects." Basic biology establishes that "prolonged or repeated disturbance" will result in increased stress levels in walruses, as measured by increased energy expenditure as a result of avoidance behavior and displacement from preferred sites. The basis for including masking of communications also is based on simple biological logic. Walruses vocalize while underwater, which can reasonably be assumed to be for underwater communication. Seismic activities produce strong sounds underwater, which it is reasonable to assume could potentially mask walrus vocalizations. Therefore, the citation provided is appropriate, as it references the FWS's agency expertise, and is appropriate when discussing "potential" effects of prolonged or repeated disturbance.

Furthermore, three paragraphs below the statement in question, the draft EIS goes on to state:

> Walruses produce a variety of sounds (grunts, rasps, clicks), which range in frequency from 0.1 Hz-10 Hz (Richardson et al., 1995a). Quantitative research on the sensitivity of walruses to noise has been limited because no audiograms (a test to determine the range of frequencies and minimum hearing threshold) have been done on walruses.

This indicates that there is uncertainty with respect to potential effects; therefore, the potential effects on a marine mammal that vocalizes underwater cannot be discounted out of hand.

API 014-072

Again, this statement was made based on consultations with our former fisheries biologist and, as written, is incorporated by reference from the seismic-survey PEA (USDOI, MMS, 2006a).

API 014-073

Due to the uncertainty regarding cause and effect with this event, the text in question was removed from the EIS.

API 014-074

In the following sentence of the draft EIS, the term "habituate" equates to "the sound does not bother them at all, and they ignore it." "One possible explanation is that these animals are more used to industrial noise and heavy traffic and, thus, are habituated to it."

The preceding portion of the paragraph clearly shows that loud underwater sound *does* bother cetaceans. To further establish the potential effects of disturbance on cetaceans, additional text has been included in Section IV.Cl.h(3)(a), Noise and Disturbance.

API 014-075

Discussions of funding options for these studies are not appropriate for the scope of this document. Questions about potential funding options for such studies should be directed to MMS Alaska Environmental Studies Section at 907-334-5281.

API 014-076

The MMS understands that leak-detection technologies used on the onshore North Slope pipeline would be comparable to the pipeline leak-detection technologies that would be used for OCS-related pipelines offshore. As such, we believe that it is appropriate to reference this spill incident.

API 014-077

See the response to comment **API 014-020**.

API 014-078

See the response to comment **API 014-020**.

API 014-079

The definition of "minimal industry traffic" is problematic because it is based on who—either industry or subsistence whalers—provides the definition. Nearshore "operational restrictions" are negotiated on a season-by-season basis, and it is only within the terms of Conflict Avoidance Agreements and marine mammal monitoring plans that such restrictions are specified.

API 014-080

The statement concerning fishing refers to subsistence fishing. The MMS has no information suggesting that subsistence fishing is "limited" in the region. The MMS has no specific provisions preventing seismic-survey activity from occurring nearshore.

API 014-081

This discussion comes from the mitigation discussion earlier in the EIS and is repeated here for the sake of clarity. The requirement for a 120-dB monitoring zone is an alternative under consideration in this EIS and in the NMFS/MMS programmatic EIS for seismic surveying in the Arctic Ocean. If mitigative criteria change, then the language of the mitigation discussed here will change.

API 014-082

This discussion comes from the mitigation discussion earlier in the EIS and is repeated here for the sake of clarity. If acoustic criteria change, then the language of the mitigation discussed here will change. The NMFS is a cooperating agency for this EIS and has provided revisions incorporating their information as they determined appropriate.

API 014-083

The USGS coring program (Phillips, 1986) found terrestrial sediments (peat) buried 4.6 m beneath the seafloor offshore in the Chukchi Sea that were dated at 11, 330 years before present in 46 m of water. The whole shelf was subareally exposed within the time period that human occupation of North America was occurring; therefore, all areas in the Chukchi Sea in water depths less than 60 m theoretically have the possibility to host prehistoric archaeological sites. The possibility of prehistoric sites is higher where there are preserved terrestrial landforms in water depths of less than 60 m. Some of these areas may have been eroded, destroyed by dynamic ice or hydraulic processes, or may never have existed—but this is determined on a case-by-case basis until a better regional picture emerges.

API 014-084

See response to comment **API 014-083**.

Document 15

CENTER FOR BIOLOGICAL DIVERSITY

BECAUSE LIFE IS GOOD.

Submitted Via Electronic Delivery at http://ocsconnect.mms.gov

December 26, 2006

Mr. John Goll
Regional Director
Alaska OCS Region, Minerals Management Service
2801 Centerpoint Drive, #500
Anchorage, AK 99503-5823

RE: Comments on Proposed Chukchi Sea Planning Area Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea, 71 Fed. Reg. 60751

Dear Mr. Goll:

Thank you for the opportunity to comment on the Minerals Management Service's ("MMS") Proposed Chukchi Sea Planning Area Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea ("proposed project"). A compact disk which contains copies of all references cited in this comment letter was sent to you under separate cover via USPS Express Mail for delivery on December 26th (ER 264940602 US). This comment letter should be read together with the references submitted on the compact disk. We request that MMS carefully review and consider these important references, and include them in the administrative record for this rulemaking.

These comments are submitted on behalf of the Center for Biological Diversity ("Center"), a non-profit public interest conservation organization with over 25,000 members nationally. The Center is dedicated to protecting imperiled species and their habitats by combining scientific research, public organizing, and administrative and legal advocacy. The primary goal of the Center's Climate, Air, and Energy Program is to reduce United States greenhouse gases and other harmful air pollutants in order to protect biological diversity, public health, and the environment.

In short, we believe that the DEIS must be revised and recirculated prior to any approval of oil exploration and development activities in the Chukchi Sea as its deficiencies in content, analysis, and conclusion are so severe as to render the DEIS and any decision based on it legally infirm. The DEIS fails to comply with the mandates of the National Environmental Policy Act, 42 U.S.C. §§4331 et seq. ("NEPA") to analyze the environmental effects of the action and to consider a reasonable range of alternatives and mitigation measures to reduce impacts.

While the flaws of the DEIS are both numerous and diverse, in this comment letter we focus on the failure of the DEIS to disclose, analyze, mitigate and otherwise take into account the greenhouse gas emissions inevitably resulting from the proposed project. Additional comments submitted by Earthjustice on our behalf on December 22, 2006 are incorporated by reference.

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Failure to Analyze Greenhouse Gas Emissions

The DEIS fails to quantify, disclose, and analyze the greenhouse gas emissions that will result from the proposed project. This failure is arbitrary, capricious, and contrary to the express mandates of both the OCSLA and NEPA. NEPA is the "basic national charter for protection of the environment." 40 C.F.R. § 1500.1(a). Congress passed NEPA in 1969, casting the statute as a landmark national effort to "encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation." 42 U.S.C. § 4321.

015-001

To accomplish these goals, all federal agencies must assess the environmental impacts of their proposals before taking any action on them. The preparation of an Environmental Impact Statement ("EIS") lies at the heart of NEPA, and must "provide full and fair discussion" of impacts like greenhouse gas emissions and global warming implications and must "inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize" these impacts. 40 C.F.R. § 1502.1.

The purpose of the NEPA review process is two-fold: "First, it places upon [the action] agency the obligation to consider every significant aspect of the environmental impact of a proposed action. Second, it ensures that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process." Kern v. United States Bureau of Land Management, 284 F.3d 1062, 1066 (9th Cir. 2002). See also Columbia Basin Protection Ass'n v. Schlesinger, 643 F.2d 585, 592 (9th Cir. 1981) ("[T]he preparation of an EIS ensures that other officials, Congress, and the public can evaluate the environmental consequences independently.").

These dual objectives require that environmental information be disseminated "early enough so that it can serve practically as an important contribution to the decisionmaking and will not be used to rationalize or justify decisions already made." 40 C.F.R. § 1502.5. See also Marsh v. Oregon Natural Resources Council, 490 U.S. 360, 371 (1989) ("the broad dissemination mandated by NEPA permits the public and other government agencies to react to the effects of a proposed action at a meaningful time"); Metcalf v. Daley, 214 F. 3d 1135, 1143-44 (9th Cir. 2000). Ultimately, an EIS does not satisfy NEPA unless "its form, content, and preparation substantially (1) provide decision-makers with an environmental disclosure sufficiently detailed to aid in the substantive decision whether to proceed with the project in light of its environmental consequences, and (2) make available to the public, information of the proposed project's environmental impacts and encourage participation in the development of that information." Trout Unlimited v. Morton, 509 F.2d 1276, 1283 (9th Cir. 1974).

The MMS proposes to approve Lease Sale 193 as part of the 2007-2012 leasing program, but has also failed to adequately deal with greenhouse gas emissions in its environmental analysis of the five year leasing program. The DEIS for the five year program discussed only the greenhouse gas emissions from the exploration, development, production, and transport of the crude oil, as well as decommissioning of development infrastructure. While these emissions, particularly methane, are substantial, they are only a small fraction of the overall emissions from the five year program, since by far the largest component of greenhouse gas emissions will be from combustion of the oil and gas

resources for energy. The DEIS here references the project's greenhouse gas emissions only in a cursory analysis of less than one page at V-19. The DEIS's reference to the five year program EIS is misleading, since that EIS did not analyze the greenhouse gas emissions from consuming the fossil fuels produced. The DEIS's reference to the Northstar EIS cannot substitute for an analysis of the impacts of proposed Lease Sale 193. The DEIS's analysis is extraordinarily cursory and completely inadequate. The DEIS has failed to even disclose the direct or cumulative greenhouse gas emissions of the proposed project, let alone explore their impacts and alternatives and mitigation measures to reduce those impacts. **015-002**

The MMS anticipates that one billion barrels of oil (Bbbl) would be produced as a result of Lease Sale 193 and that the cumulative production would be 6.6-17.8 Bbbl. While we believe that the cumulative estimate severely understates the true cumulative impacts, since the cumulative case has been inappropriately constrained, nonetheless this is an extremely significant amount of fossil fuel production and both the direct and cumulative impacts must be thoroughly analyzed.

Yet in the place of actual analysis, the DEIS states "…because emissions from the actual combustion of oil products are much greater than the emissions from production operations, the effect on climate change from Alternative I would be negligible, as the level of oil consumed in the United States, with or without this Alternative, likely would not change." DEIS V-19. This conclusory assertion is incorrect at every level. The impacts of the proposed project are not negligible, and must be analyzed. Further, the MMS must truly analyze alternatives not within its jurisdiction, such as energy conservation, to reduce the impacts of the proposed project. The fossil fuel use from Lease Sale 193 could easily be offset through conservation measures including increasing building energy efficiency and increasing vehicle fuel economy. These measures would eliminate the need for consuming the fossil fuels that would be produced by Lease Sale 193. The DEIS's failure to disclose this information to the public violates NEPA. The DEIS's assumption that government policies and actions will not impact oil consumption in this country are unsupported and incorrect. **015-003**

As a result of ignoring these emissions, the MMS has failed completely to consider a critical aspect of the problem, rendering each and every section of the DEIS incomplete and inadequate. Because the MMS chose, bizarrely, not to consider the greenhouse gas emissions from the oil and gas resources, the DEIS discusses global warming as if it were a phenomenon independent of the proposed project, instead of discussing the project's significant direct and cumulative contribution to global warming. The MMS's approach is an egregious violation of NEPA. **015-004**

The MMS's failure to consider the greenhouse gas emissions from the oil and gas resources similarly infects the MMS's substantive decisionmaking under OCSLA. The MMS cannot properly consider the environmental damage and the adverse impact on the coastal zone of the Program without considering its greenhouse gas emissions and global warming implications. An analysis which has omitted entirely what is arguably the single most significant environmental impact of the project is per se inadequate.

As discussed further below, the public and decisionmakers are entitled to know the true costs and impacts of all aspects of the proposed project, including its greenhouse gas emissions. Laying bare the true impacts and costs of the direct and cumulative greenhouse gas emissions from the OCS production program, and disclosing alternatives and mitigation measures, would very likely lead to increased energy conservation and use of renewable energy sources. The MMS prevented this result by producing

a DEIS that hid the true greenhouse gas emissions of its proposal. Because, as explained further below, this error has infected every aspect of the decisionmaking process, the MMS must prepare a revised DEIS that properly considers the greenhouse gas and global warming implications of the Program, prior to approving Lease Sale 193. 015-005

The DEIS Contains Incorrect and Misleading Information

In addition to the overarching failure of the MMS to consider the greenhouse gas emissions of the oil and gas resources, one of the most important environmental impacts of the Program, the DEIS also contains numerous instances of outdated, inaccurate information which fatally taints the analysis. Among other obligations, the MMS is required to "describe the environment of the areas to be affected or created by the alternatives under consideration." 40 CFR 1502.15. The establishment of the baseline conditions of the affected environment is a practical requirement of the NEPA process. In Half Moon Bay Fisherman's Marketing Ass'n v. Carlucci, 857 F.2d 505, 510 (9th Cir. 1988), the Ninth Circuit states that "without establishing . . . baseline conditions . . . there is simply no way to determine what effect [an action] will have on the environment, and consequently, no way to comply with NEPA." The DEIS has failed utterly to accurately describe the baseline conditions with regard to atmospheric greenhouse gas concentrations, global warming, and other issues. 015-006

At II-18 the DEIS discusses climate change in the Arctic in a misleading and incorrect fashion, and fails to acknowledge that the best available science indicates that a significant portion of recent warming is due to anthropogenic greenhouse gas emissions, upon which other sources of variability, such as the Arctic Oscillation (AO), operate. At III-16, the DEIS states that the causes of sea-ice decline in the Arctic are "ambiguous." This is incorrect, misleading, and renders the DEIS inadequate. The MMS appears to have contracted all or portions of the DEIS to authors who are not qualified to discuss global warming science, as the authors committed numerous other errors, including confusing the IPCC's Third Assessment Report with the earlier Second Assessment Report. III-114. 015-007

In general, the DEIS understates the scientific understanding of global warming and overstates remaining uncertainties. The DEIS fails to acknowledge, for example, that the basic physics underlying global warming are as well established as any phenomena in the planetary sciences. The DEIS also ignores some of the most critical scientific advances of the past few years. For example, important advances in the detection and attribution of global warming have demonstrated, beyond any legitimate scientific debate, that a significant portion of recently observed warming is due to anthropogenic greenhouse gas emissions (Barnett et al. 2005, LLNL 2006). Scientists have also demonstrated that anthropogenic greenhouse gas emissions have altered the energy balance of the earth by 0.85 ± 0.15 watts per square meter (Hansen et al. 2005). Due to the lag time in the climate system, this energy imbalance commits the earth to additional warming of .6° C (1° F) of warming that is already "in the pipeline," even absent additional greenhouse gas emissions (Hansen et al. 2005). 015-008

Perhaps most importantly, scientists' ability to predict future change from continued greenhouse gas emissions is far greater than stated by the DEIS. Leading scientists are now able to tell us, with a high degree of certainty, that additional warming of more than 1° C (1.8° F) above year 2000 levels will constitute "dangerous climate change," with particular reference to sea level rise and species extinction (Hansen 2006; Hansen et al. 2006a,b). Furthermore, scientists are able tell us the atmospheric greenhouse gas level "ceiling" that must not be exceeded in order to prevent additional warming of more 015-009

than 1° C (1.8° F) above year 2000 levels (Hansen 2006; Hansen et al. 2006a,b). In turn, scientists can tell us the limitations that must be placed on greenhouse gas emissions in order to not exceed this "ceiling" of approximately 450 ppm of carbon dioxide.[1]

In order to stay within the ceiling, emissions must follow the "alternative," rather than the "business as usual," greenhouse gas emissions scenario (Hansen 2006; Hansen et al. 2006a,b; Hansen and Sato 2004). In the business as usual scenario, carbon dioxide emissions continue to grow at about 2% per year, and other greenhouse gases such as methane and nitrous oxide also continue to increase (Hansen 2006; Hansen et al. 2006a,b). In the alternative scenario, by contrast, carbon dioxide emissions decline moderately between now and 2050, and much more steeply after 2050, so that atmospheric carbon dioxide never exceeds 475 parts per million (Hansen 2006; Hansen et al. 2006a,b). The alternative scenario would limit global warming to less than an additional 1° C in this century (Hansen 2006; Hansen et al. 2006a,b).

Since the year 2000, however, society has not followed the alternative scenario. Instead, carbon dioxide emissions have continued to increase by 2% per year since 2000 (Hansen 2006; Hansen et al. 2006a,b). If this growth continues for just ten more years, the 35 % increase in CO_2 emissions between 2000 and 2015 will make it implausible to achieve the alternative scenario (Hansen 2006; Hansen et al. 2006a,b). Moreover, the "tripwire" between keeping global warming at less than 1° C, as opposed to having a warming that approaches the range of 2-3° C, may depend upon a relatively small difference in anthropogenic greenhouse gas emissions (Hansen 2006; Hansen et al. 2006a,b). This is because warming of greater than 1° C may induce positive climate feedbacks, such as the release of large amounts of methane from thawing arctic permafrost, that will further amplify the warming (Hansen 2006; Hansen et al. 2006a,b).

Just ten more years on current greenhouse gas emissions trajectories will essentially commit us to climate disaster. Dr. James E. Hansen, Director of the NASA Goddard Institute for Space Studies, and NASA's top climate scientist, has stated: "In my opinion there is no significant doubt (probability > 99%) that . . . additional global warming of 2° C would push the earth beyond the tipping point and cause dramatic climate impacts including eventual sea level rise of at least several meters, extermination of a substantial fraction of the animal and plant species on the planet, and major regional climate disruptions" (Hansen 2006:30).

In order to avoid truly unacceptable consequences of global warming, we must stop the growth of greenhouse gas emissions, and, in relatively short order, begin reducing them. Achieving the reductions necessary to keep additional global warming beyond the year 2000 within 1° C will be extremely challenging.

Moreover, the impacts are occurring more rapidly than scientists anticipated even just a few years ago:

> Animal and plant species have begun dying off or changing sooner than predicted because of global warming, a review of hundreds of research studies contends.

[1] This limit may increase slightly to 475 ppm carbon dioxide if other quantities of other greenhouse gases such as methane and nitrous oxide are reduced (Hansen 2006; Hansen et al. 2006a,b).

These fast-moving adaptations come as a surprise even to biologists and ecologists because they are occurring so rapidly.

At least 70 species of frogs, mostly mountain-dwellers that had nowhere to go to escape the creeping heat, have gone extinct because of climate change, the analysis says. It also reports that between 100 and 200 other cold-dependent animal species, such as penguins and polar bears are in deep trouble.

"We are finally seeing species going extinct," said University of Texas biologist Camille Parmesan, author of the study. "Now we've got the evidence. It's here. It's real. This is not just biologists' intuition. It's what's happening."

Her review of 866 scientific studies is summed up in the journal Annual Review of Ecology, Evolution and Systematics.

Parmesan reports seeing trends of animal populations moving northward if they can, of species adapting slightly because of climate change, of plants blooming earlier, and of an increase in pests and parasites.

Parmesan and others have been predicting such changes for years, but even she was surprised to find evidence that it's already happening; she figured it would be another decade away.

Just five years ago biologists, though not complacent, figured the harmful biological effects of global warming were much farther down the road, said Douglas Futuyma, professor of ecology and evolution at the State University of New York in Stony Brook.

"I feel as though we are staring crisis in the face," Futuyma said. "It's not just down the road somewhere. It is just hurtling toward us. Anyone who is 10 years old right now is going to be facing a very different and frightening world by the time that they are 50 or 60."

Borenstein 2006:1.

The rate of publication of articles relating to the biological responses to global warming increases each year (Parmesan 2006). Approximately 40 percent of 866 papers published between 1899 and January 2006 dealing with climate change impacts on species were published since January, 2003 (Parmesan 2006). This highlights the importance of utilizing current research. The DEIS has systematically failed to do so.

The DEIS fails to acknowledge this critical context in which the proposed project's enormous greenhouse gas emissions must be analyzed. It is well established that Administration officials have attempted to suppress and downplay scientific research related to global warming (Giles 2006). The DEIS's inaccurate statements regarding global warming reflects either ignorance of the science or a deliberate attempt to mislead. Neither has any place in a legally adequate DEIS. The MMS cannot comply with its legal obligation to fully analyze and disclose the impact of the project on the environment without accurately characterizing the global warming problem.

015-010

The DEIS Fails to Consider the Economic Cost of the Project's Greenhouse Gas Emissions

The DEIS also failed to disclose the economic cost of the Program's greenhouse gas emissions. At IV 32-33, the DEIS states "[s]ubstituting energy-saving technology (adding insulation to buildings or more efficient engines in vehicles, etc.) or consuming less energy (lowering thermostat settings during the winter; using public transportation rather than private automobiles) will conserve energy. The former could result in positive net gains to the environment but will impose costs to manufacturers and consumers. The amount of environmental gain would be balanced by negative effects on the economy." This is demonstrably incorrect.

015-011

A large, peer-reviewed literature exists on estimating the social costs of climate change and quantifying the cost of carbon dioxide emissions (Stern 2006). As this field has developed, the methodology and inclusiveness of economic studies has improved. At the same time, the scientific understanding of global warming impacts and predictive ability has also improved. The result is that the estimated cost of greenhouse gas emissions in the literature has increased steadily, and we now know that the cost of continued greenhouse gas emission trajectories would be astronomical (Stern 2006). While monetizing the impact of greenhouse gas emissions cannot substitute for a full discussion of all impacts under NEPA, an estimate of the economic costs should have been included in the DEIS. The failure to include this information further skewed the DEIS's already bizarre and arbitrary perspective, discussed above, that energy conservation will have "negative effects on the economy." DEIS IV-33.

015-012

Very few of the early economic studies included any non-market damages such as species extinction, or the risk of potential extreme weather such as hurricanes, droughts, and floods (Watkiss et al. 2005). None have included socially contingent effects, or the potential for longer-term effects and catastrophic events (Watkiss et al. 2005). This indicates that values in the literature are a subtotal of the full economic (or social) cost of greenhouse gas pollution, and therefore by definition are underestimates, though researchers cannot yet say by how much (Watkiss et al. 2005).

Researchers have concluded that $73/tc[2] (year 2010) is a reasonable figure for decisionmakers to use as a lower benchmark of the economic cost of greenhouse gas emissions, but this figure rises sharply over time (Downing et al. 2005). An upper benchmark is more difficult to deduce from the current literature but the risk of higher values for the social cost of carbon is significant (Downing et al. 2005, Watkiss et al. 2005). One widely respected report commissioned for the British government recommended that decisionmakers use the range of values displayed in Table 1.

015-013

[2] tc = tonne carbon = 3.664 tons of carbon dioxide.

Table 1: Economic Cost of Carbon: Values for Use in Project Appraisal (USD per ton carbon) (Source: Adapted from Watkiss et al. 2005:ix)[3]

Year of Emission	Central Guidance	Lower Central Estimate	Upper Central Estimate
2000	$101	$64	$238
2010	$119	$73	$293
2020	$146	$91	$375
2030	$183	$119	$475
2040	$256	$165	$603
2050	$384	$238	$768

015-014

The Stern Review of the Economics of Climate Change, another comprehensive report commissioned by the British government, recently concluded that allowing current emissions trajectories to continue unabated would eventually cost the global economy between 5 to 20 percent of GDP each year within a decade, or up to $7 trillion, and warned that these figures should be considered conservative estimates (Stern 2006). By contrast, measures to mitigate global warming by reducing emissions were estimated to cost about one percent of global GDP each year (Stern 2006). One percent of global GDP is roughly what the world spends annually on advertising.[4]

The DEIS's failure to include information relating to the economic cost of the Program's greenhouse gas emissions rendered it legally inadequate. The DEIS essentially advocates for a "business as usual" approach to offshore oil and gas production, while ignoring the true costs and impacts of this fossil fuel use and dismissing alternatives as having "negative impacts to the economy." This approach is fundamentally flawed and the DEIS must be revised.

The DEIS Fails to Analyze the Project's Cumulative Impacts

NEPA's cumulative impacts analysis requirement was added to address problems like greenhouse gas emissions that may appear individually insignificant, but cumulatively create a serious environmental problem. It is difficult to imagine a more important cumulative impact analysis than that for the offshore oil and gas production program. The American public and our decisionmakers are entitled to understand the impacts that result from the greenhouse gas emissions of our oil and gas use. Once again, the DEIS utterly failed to provide this information. The DEIS should have disclosed and analyzed the greenhouse gas emissions from past, proposed, and estimated future production. The DEIS should also have examined other major sources of greenhouse gas emissions to provide an adequate overall description of cumulative impacts. The DEIS fails to do so.

The end result is an internally inconsistent DEIS with a serious logical disconnect between many of the statements. For example, a discussion of the impacts of global warming on polar bears at V-48-52 is followed by the non-sensical conclusion that, based on the impacts of global warming on polar bears, that the future effectiveness of mitigation measures must be carefully monitored. While this is true as

015-015

[3] Figures from Watkiss et al. 2005:ix were converted from GBP (£) to USD ($) with the exchange rate calculator at http://coinmill.com/GBP_USD.html on July 18, 2006 and rounded to the nearest dollar.
[4] http://www.grist.org/news/daily/2006/10/30/1/index.html (accessed on November 21, 2006).

far as it goes, it is incomplete and inadequate to deal with the problem. The conclusion is misleading because it ignores the fact that no successful mitigation of the impact of global warming on polar bears is possible unless greenhouse gas emissions are reduced sufficiently to slow global warming and ultimately stabilize the climate system. It also ignores the contribution of the proposed project and the MMS's offshore oil and gas program to global warming and to the plight of the polar bear. The DEIS's cumulative impacts analysis section must be revised to include a real discussion of the impacts from global warming and the proposed project's cumulative contribution.

Global warming represents the most significant and pervasive threat to the future of biodiversity worldwide, affecting both terrestrial and marine species from the tropics to the poles. Peer-reviewed studies have concluded that 35 percent of species could be committed to extinction by the year 2050 if current emissions trajectories continue and that these extinctions could be significantly reduced if greenhouse gas emissions fall (Thomas 2004).

The current and future impact of global warming on marine mammals is unfortunately all too clear. Species like the polar bear simply cannot survive the loss of their arctic sea-ice habitat (Derocher et al. 2004). The Center has summarized both the global warming and polar bear biology literature and demonstrated that polar bears meet the definition of a threatened or endangered species under the U.S. Endangered Species Act and will become extinct if greenhouse gas emissions are not greatly reduced (Center for Biological Diversity 2006). Other Arctic species are similarly at risk (ACIA 2004; Cooper 2006). **015-016**

Entire cultures and ways of life around the globe, including in the Arctic, are at risk. Many Arctic peoples, such as the Inuit, who rely upon hunting for their primary food supply, are suffering from these changes, as well as from a reduction in weather predictability and travel safety, and face "serious challenges to human health and food security, and possibly even the survival of some cultures" (ACIA 2004). Some communities and industrial facilities in coastal zones are already being forced to relocate due to severe coastal erosion as rising sea level and a reduction in sea ice allow higher waves and storm surges to reach the shore (ACIA 2004). **015-017**

Calcifying marine species such as coral may be particularly hard-hit by a double impact of both increasing ocean temperatures and increasing ocean acidification from increasing levels of dissolved carbon dioxide in seawater (Hughes 2003).

The impacts to biological diversity go hand-in-hand with the impacts to human society. The World Health Organization estimates that as of the year 2000, 154,000 lives are already lost annually due to global warming (WHO 2002). In the Harvard Medical School publication *Climate Change Futures: Health, Ecological, and Economic Dimensions*, experts predict a number of profound consequences for human health if worldwide greenhouse gas emissions continue on current trajectories (Epstein and Mills 2005). Predictions include an increase in diseases such as malaria, West Nile Virus, and Lyme disease, as well as an increase in pollen production, allergies, and allergic diseases such as asthma (Epstein and Mills 2005). **015-018**

Deaths from factors like dehydration and heat stroke associated with more frequent heat waves are projected to triple in many urban centers in the U.S. (Epstein and Mills 2005). "With the likelihood of [extreme heat waves] projected to increase 100-fold over the next four decades, it is difficult to avoid

the conclusion that potentially dangerous anthropogenic interference with the climate system is already underway . . . by the end of this century 2003 [in which between 22,000 and 35,000 Europeans died in heat waves] would be classed as an unusually cold summer." (Epstein and Mills 2005). Damage to humans and infrastructure from floods is also predicted to increase (Epstein and Mills 2005).

Scientists have long predicted increasing weather variability and heightened intensity of storms like hurricanes due to increasing ocean temperatures (Epstein and Mills 2005). Extreme weather events have in fact increased, with catastrophic results, both in loss of lives and in economic costs (Epstein and Mills 2005). Global weather-related losses from extreme events have increased dramatically since the 1950s, measured in 2004 U.S. dollars (Epstein and Mills 2005). "While no one event is diagnostic of climate change, the relentless pace of unusually severe weather since 2001 – prolonged droughts, heat waves of extraordinary intensity, violent windstorms and more frequent '100 year' floods – is descriptive of a changing climate" (Epstein and Mills 2005).

One of the most troubling recent findings is that the 2001 IPCC projection for sea level rise is almost certainly a significant underestimate. Melting of the Greenland ice sheet has accelerated far beyond what scientists predicted even just a few years ago, with melting in 2004 occurring at 10 times the rates observed in 2000 (Epstein and Mills 2005; ACIA 2004; Overpeck et al. 2006). Sea level rise in line with past underestimates would still inundate substantial areas of the coast and have far-reaching consequences. Yet just 2-3° C of additional warming would likely cause sea level to rise by at least 18 feet (6 m) within a century, and would flood vast areas and displace millions of people (Hansen 2006).

As discussed above, the economic costs of global warming, accordingly, will be astronomical. The DEIS must be revised to include a meaningful cumulative impacts analysis that fully analyzes the proposed project's cumulative impacts in each of these areas.

The Requirements of the Global Change Research Act

Concerned that the consequences of human-induced global warming will "adversely affect world agricultural and marine production, coastal habitability, biological diversity, human health, and global economic and social well-being," Congress passed the Global Change Research Act in 1990. 15 U.S.C. §2931(a)(2). The purpose of the GCRA is "to provide for development and coordination of a comprehensive and integrated United States research program which will assist the Nation and the world to understand, assess, predict, and respond to human-induced and natural processes of global change." 15 U.S.C. § 2931(b).

To this end, the GCRA requires the Climate Change Science Program ("CCSP") to prepare, not less frequently than every 4 years, a scientific assessment which:

(1) integrates, evaluates, and interprets the findings of the Program and discusses the scientific uncertainties associated with such findings;
(2) analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and
(3) analyzes current trends in global change, both human-[induced] and natural, and projects major trends for the subsequent 25 to 100 years.

15 U.S.C. § 2936.

This scientific assessment (hereineafter "National Assessment") is to be used by "all Federal agencies and departments" in "responding to human-induced and natural processes of global change pursuant to other statutory responsibilities." 15 U.S.C. § 2938(b)(2). The MMS has a clear duty to use the National Assessment in its evaluation of the proposed project, and has failed to do so. **015-019**

The last National Assessment was transmitted to Congress in November, 2000. This 600-page report entitled C*limate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change* and its associated 154-page summary sought to identify the key climatic vulnerabilities of particular regions and economic sectors of the country in the context of the changes in the nation's environment, resources, and economy. While the CCSP has missed the deadline of November, 2004, for completion of the updated National Assessment, this does not excuse the MMS from using the available version supplemented by the best available scientific information. Key publications since the November, 2000 National Assessment include IPCC (2001), ACIA (2004), Epstein and Mills (2005) and Shellnhuber (2006). At a bare minimum, these major synthesis reports must be considered along with the National Assessment in a revised EIS for the proposed project.

The Requirements of the Endangered Species Act

The ESA was enacted, in part, to provide a "means whereby the ecosystems upon which endangered species and threatened species depend may be conserved...[and] a program for the conservation of such endangered species and threatened species..." 16 U.S.C. § 1531(b). The ESA "is the most comprehensive legislation for the preservation of endangered species ever enacted by any nation." Tennessee Valley Authority v. Hill, 437 U.S. 153, 180 (1978). The Supreme Court's review of the ESA's "language, history, and structure" convinced the Court "beyond a doubt" that "Congress intended endangered species to be afforded the highest of priorities." Id. at 174. As the Court found, "the plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, whatever the cost." Id. at 184.

The ESA vests primary responsibility for administering and enforcing the statute with the Secretaries of Commerce and Interior. The Secretaries of Commerce and Interior have delegated this responsibility to the National Marine Fisheries Service ("NMFS") and the U.S. Fish and Wildlife Service ("FWS") respectively. 50 C.F.R. §402.01(b). NMFS has primary responsibility for administering the ESA with regards to most marine species, including corals, sea turtles and most marine mammals, while FWS has responsibility for terrestrial species, as well as some marine mammals, and all seabirds.

Section 2(c) of the ESA establishes that it is "…the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act." 16 U.S.C. § 1531(c)(1). The ESA defines "conservation" to mean "…the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary." 16 U.S.C. § 1532(3). Similarly, Section 7(a)(1) of the ESA directs that the Secretary review "…other programs administered by him and utilize such programs in furtherance of the purposes of the Act." 16 U.S.C. § 1536(a)(1). The purpose of the ESA is to conserve

endangered or threatened species. Among the "other programs administered by" the Secretary of the Interior is the administration of the Outer Continental Shelf Leasing Program through the MMS. See also Sierra Club v. Glickman, 156 F.3d 606, 617 (5th Cir. 1998) (Section 7(a)(1) "contains a clear statutory directive (it uses the word 'shall') requiring the federal agencies to consult and develop programs for the conservation of" listed species); accord Florida Key Deer v. Stickney, 864 F.Supp. 1222, 1238 (S.D. Fla. 1994).

In order to fulfill the substantive purposes of the ESA, Federal agencies, such as the MMS, are required to engage in consultation with NMFS or FWS to "insure that any action authorized, funded, or carried out by such agency...is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the adverse modification of habitat of such species... determined...to be critical..." 16 U.S.C. § 1536(a)(2) (Section 7 consultation).

Section 7 consultation is required for "any action [that] may affect listed species or critical habitat." 50 C.F.R. § 402.14. Agency "action" is defined in the ESA's implementing regulations to include "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air." 50 C.F.R. § 402.02. (emphasis added). See also Pacific Rivers Council v. Thomas, 30 F.3d 1050, 1054-55 (9th Cir. 1994), cert. denied, 514 U.S. 1082 (1995)(recognizing that Congress intended "agency action" to be interpreted broadly, admitting of no limitations).

When a proposed action may affect a protected species, consultation must occur and be completed before the federal action may take place. Pacific Rivers, 30 F.3d at 1056; Thomas v. Peterson, 753 F.2d 754, 764-65 (9th Cir. 1985). If an agency fails to consult on an action that affects listed species, all activities that "may affect" the species must be enjoined. Pacific Rivers, 30 F.3d at 1056-57. ("[The Forest Service's] conclusion that these activities "may affect" the protected salmon is sufficient reason to enjoin these projects. Only after the Forest Service complies with § 7(a)(2) can any activity that may affect the protected salmon go forward.").

During the course of consultation, NMFS or FWS may "suggest modifications" to the action to "avoid the likelihood of adverse effects" to the listed species. 50 C.F.R. § 402.13. At the completion of consultation NMFS or FWS issues a Biological Opinion ("BO") that determines if the agency action is likely to jeopardize the species. See 50 C.F.R. § 402.02. If so, the agency may not proceed with any program, permit, or decision that would jeopardize a species' survival unless the BO specifies reasonable and prudent alternatives that will avoid jeopardy and allow the agency to proceed with the action. 16 U.S.C. § 1536(b). See also Sierra Club v. Marsh, 816 F.2d 1376, 1384-86 (9th Cir. 1987) (enjoining highway construction because agency could not meet burden of absolute assurance that mitigation required to avoid jeopardy was possible).

Prior to entering consultation, the action agency (MMS in this instance) must first prepare a biological assessment. Section 7(c)(1) of the ESA provides that "each Federal agency shall, with respect to any agency action of such agency. . ., request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action. 16 U.S.C. §

1536(c)(1). In addition, this section provides that "if the Secretary advises. . . that such species may be present, such agency shall conduct a biological assessment for the purpose of identifying any endangered species or threatened species which is likely to be affected by such action." 16 U.S.C. § 1536(c)(1).

Although procedural, consultation is the backbone of the ESA. As the Ninth Circuit recognized, "[o]nly by requiring substantial compliance with the act's procedures can we effectuate" congressional intent to protect species. Sierra Club v. Marsh, 816 F.2d at 1384 (9th Cir. 1987).

Section 9 of the ESA and its implementing regulations prohibit any person from "taking" a threatened or endangered species. 16 U.S.C. § 1538(a)(1); 50 C.F.R. § 17.31; 50 C.F.R. § 227.11; 50 C.F.R. § 227.12; 50 C.F.R. § 227.21; 50 C.F.R. § 227.71. A "person" includes private parties as well as local, state, and federal agencies. 16 U.S.C. § 1532(13). "Take" is defined broadly under the ESA to include harming, harassing, trapping, capturing, wounding, or killing a protected species either directly or by degrading its habitat sufficiently to impair essential behavior patterns. 16 U.S.C. § 1532(19).

The ESA not only bans the acts of parties directly causing a take, but also bans the acts of third parties whose acts bring about the taking. Strahan v. Coxe, 127 F.3d 155, 163 (1st Cir. 1997), cert. denied, 119 S. Ct. 81 (1998) ("We believe that . . . a governmental third party pursuant to whose authority an actor directly exacts a taking of an endangered species may be deemed to have violated the provisions of the ESA."). See also Babbitt v. Sweet Home Chapter of Communities for a Great Oregon, 515 U.S. 687, 704 (1995)("Congress intended 'take' to apply broadly to cover indirect as well as purposeful actions."); Palila v. Hawaii Dept. of Land and Natural Resources, 852 F.2d 1106, 1108 (9th Cir. 1988), citing S. Rep. No. 93-307, at 7 (1973) ("'Take' is defined... in the broadest possible manner to include every conceivable way in which a person can 'take' or attempt to 'take' any fish or wildlife.").

MMS cannot reasonably dispute that the proposed project affects ESA-listed species. Numerous listed species inhabit the waters and adjacent terrestrial habitat subject to Lease Sale 193. However, the MMS must also analyze the direct, indirect, and cumulative impacts of the project on species that do not occur in the immediate vicinity of the oil exploration, production, and transportation, but will nonetheless be impacted by the proposed project's greenhouse gas emissions or other impacts. Numerous listed species are affected by global warming and therefore the greenhouse gas emissions of the proposed project "may affect" such species, triggering the consultation requirement. While virtually every listed species is likely to be affected to some degree by global warming, we will focus our comments on the two listed coral species, elkhorn and staghorn corals, as the final listing rule for the species specifically discussed the impacts of global warming and greenhouse gas emissions on the species. See 71 Fed. Reg. 26852.

015-020

Coral reefs are among the first ecosystems to show the significant adverse impacts of global warming (Hoegh-Guldberg 1999). An estimated 30% are already severely degraded and 60% may be lost by 2030 (Hughes et al. 2003). The primary cause of coral reef degradation is bleaching, the expulsion of symbiotic algal zooxanthellae from coral due to elevated sea temperatures (Hoegh-Guldberg 1999). As the authors of an authoritative review in the leading journal Science put it:

> The link between increased greenhouse gases, climate change, and regional-scale bleaching of corals, considered dubious by many reef researchers only 10 to 20 years ago, is now incontrovertible. Moreover, future changes in ocean chemistry due to higher atmospheric carbon dioxide may cause weakening of coral skeletons and reduce the accretion of reefs, especially at higher latitudes. The frequency and intensity of hurricanes (tropical cyclones, typhoons) may also increase in some regions, leading to a shorter time for recovery between recurrences. The most pressing impact of climate change, however, is episodes of coral bleaching and disease that have already increased greatly in frequency and magnitude over the past 30 years.

(Hughes et al. 2003).

Elkhorn and staghorn coral were as recently as 30 years ago the dominant reef building corals in the Caribbean and Gulf of Mexico (Precht and Aronson 2004). They have subsequently declined by upwards of 90%. Id. The primary drivers of the decline have been disease and temperature induced bleaching. 71 Fed. Reg. 26852; (Pandofi et al. 2005). The coral diseases impacting the species have also been linked to elevated water temperatures (Harvell et al. 2002). As NMFS itself stated in the listing rule:

> The major threats to these species' persistence (i.e., disease, elevated sea surface temperature, and hurricanes) are severe, unpredictable, have increased over the past 3 decades, and, at current levels of knowledge, the threats are unmanageable.

71 Fed. Reg. at 26858. Each of these threats is directly related to greenhouse gas emissions. Moreover, CO_2 emission themselves are resulting in acidification of the ocean, inhibiting coral growth.

> Along with elevated sea surface temperature, atmospheric carbon dioxide levels have increased in the last century, and there is no apparent evidence the trend will not continue. As atmospheric carbon dioxide is dissolved in surface seawater, seawater becomes more acidic, shifting the balance of inorganic carbon away from carbon dioxide and carbonate toward bicarbonate. This shift decreases the ability of corals to calcify because corals are thought to use carbonate, not bicarbonate, to build their aragonite skeletons. Experiments have shown a reduction of coral calcification in response to elevated carbon dioxide levels; therefore, increased carbon dioxide levels in seawater may be contributing to the status of the two species.

71 Fed. Reg. at 26858-9.

The impacts of greenhouse gas emission and global warming on the elkhorn and staghorn corals are well established. MMS cannot simply ignore them in abrogation of its ESA responsibilities.[5]

015-021

MMS is Violating Sections 2, 7 and 9 of the ESA

[5] The DEIS's deficient treatment of direct and indirect impacts of the Program on the listed coral species renders its analysis deficient under NEPA and OCSLA as well.

MMS is also utterly ignoring its affirmative conservation mandates under Sections 2(c) and 7(a)(1) of the ESA. Section 7(a)(1) of the ESA specifically directs that the Secretary of Interior review "…other programs administered by him and utilize such programs in furtherance of the purposes of the Act." 16 U.S.C. § 1536(a)(1). The purpose of the ESA is to conserve endangered or threatened species. Among the "other programs administered by" the Secretary of the Interior is the administration of the OCSLA Program through the MMS. Nowhere in the DEIS or Program is there any indication that the Secretary/MMS has even considered these statutory obligations.

This plain language interpretation of the statute is also completely consistent with the "overriding need" of Congress, as expressed throughout the ESA, "to devote whatever effort and resources were necessary to avoid further diminution of national and worldwide resources." TVA v. Hill, 437 U.S. at 177 (internal citation omitted). In view of the clear statutory scheme that applies here, one need look no further than the Supreme Court's analysis in TVA v. Hill to reject completely any excuse put forward by MMS for why it need not consult to "insure" that its actions are not likely to jeopardize the continued existence of listed species such as the elkhorn and staghorn corals, the leatherback and loggerhead sea turtle, or the North Pacific right whale. In TVA v. Hill, the action agency insisted that the requirements of Section 7 could not possibly apply to its actions, as MMS claims now, because the Tellico dam was near completion, had already cost $100 million, would provide much needed flood control and electric heat for 20,000 homes, and because "there [were] no alternatives to impoundment of the reservoir, short of scrapping the entire project." See 437 U.S. at 157, 166, 172.

015-022

Conclusion

As discussed above, we believe that the DEIS is so deficient that MMS's only option is to completely revise and update it to include an accurate, current, and complete discussion of the impacts of the greenhouse gas emissions from the proposed project, of the impacts of global warming on the resources affected by the proposed project, and of impacts on listed species and marine mammals from the direct and indirect effects of the proposed project.

Copies of all references cited in the text and listed in the Literature Cited below were sent to you on compact disk under separate cover. We request that MMS carefully review and consider these important references. They are also part of the administrative record for this rulemaking.

Thank you very much for your consideration of these comments. Please contact either of us at (760) 366-2232 or at the address on this letterhead if you have any question or concerns.

Yours Sincerely,

Kassie Siegel
Climate, Air, and Energy Program Director

Brendan Cummings
Oceans Program Director

Center for Biological Diversity

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MMS Responses to Center for Biological Diversity Comments

CBD 015-001

The draft EIS clearly identifies the types of sources and emissions related to activities that could reasonably be expected to result from the proposed lease sale (Sec. IV.C.15.b(1)(a)). Carbon dioxide is not an emission regulated under the Clean Air Act. As discussed in Section III.A.6, emissions related to OCS activities are regulated by USEPA. Facilities within 25 miles of the State's seaward boundary would be subject to the State of Alaska air quality standards; facilities beyond 25 miles of the State's seaward boundary would be subject the USEPA's New Source Performance Standards and Prevention of Significant Deterioration regulations.

CBD 015-002

The contribution of OCS activities to greenhouse gas emissions is discussed at the programmatic level in the final EIS for the 2002-2007 OCS Leasing Program (USDOI, MMS, 2002:Section 4.1.2) and in the draft EIS for the 2007-2012 OCS Leasing Program (USDOI, MMS, Herndon, 2006:Sec. IV.A.1), and this information is incorporated by reference. Activities projected to result from the proposed lease sale are expected to contribute a small amount to overall hydrocarbon emissions into the planet's atmosphere. If any activities are proposed as a result of the proposed lease sale, project- and site-specific air quality analysis will be done, emissions modeling would be completed if warranted, and mitigation measures appropriate to the location and specific equipment would be developed. Although carbon dioxide is not an emission regulated under the Clean Air Act and not subject to State of Alaska air quality standards and USEPA's New Source Performance Standards and Prevention of Significant Deterioration regulations, the MMS would work with operators to minimize such emissions and ensure use of the best available emissions control technology.

CBD 015-003

The greenhouse gas emissions associated with OCS oil and gas activities were analyzed in the final EIS for the OCS Leasing Program 2002-2007. Impacts from energy consumption are outside the scope of the EIS. Energy consumption is outside the control of MMS and can be analyzed only from a national perspective taking into account policy, technological, economic, and environmental factors. A discussion of alternative energy is presented in Section 4.7 of the FEIS for the OCS Leasing Program 2002-2007 and Section IV.I of the final EIS for the OCS Leasing Program 2007-2012. If the proposed leasing program does not occur, MMS projects that most of the lost oil production would be replaced by a combination of imports, fuel switching, and increased onshore production. The remaining percentage that would not be developed is expected to trigger some modest conservation measures, which would have some benefits in terms of reduced greenhouse gas emissions. However, this benefit could be offset by a boost in CO_2 emissions from tanker transport as a consequence of a greater reliance on oil imports. More importantly, if there is a significant switch from natural gas to oil as a result of lost OCS gas production, the benefits from conservation measures could be offset, because oil combustion causes more CO_2 emissions than gas combustion. A clean energy policy would not forestall the need to develop OCS oil and gas resources, however. Because the U.S. imports about 60% of its oil needs, OCS oil and gas resources will still fill a role in the Nation's energy production in the foreseeable future.

CBD 015-004

As discussed in Section III.A.6, emission related to OCS activities are regulated by USEPA. See response to comment **CBC 015-001**.

CBD 015-005

An analysis of the true costs and impacts of the proposed lease sale is not possible, given the fact that the amount of oil and gas resources discovered and developed as a result of the proposed lease sale would be

small compared to national production levels. For a discussion of alternative energy sources, see the response to comment **CBD 015-003**.

CBD 015-006

An analysis of impacts from greenhouse gas emissions is found in the final EIS for the OCS Leasing Program 2002-2007. A more comprehensive and updated treatment is found in the EIS for the OCS Leasing Program 2007-2012. The treatment of baseline conditions in the EIS is appropriate. The baseline used in the EIS is defined by the existing environment at the time the Proposed Action is under consideration. The MMS realizes that the environment changes over time, but these changes occur in a way that cannot be assessed with certainty, so the cumulative analysis must be based on an extrapolation of trends. For this reason, MMS considers climate change as one of the impacting agents in the cumulative analysis in the final EIS for the OCS Leasing Program 2007-2012.

CBD 015-007

The discussion of changes in sea ice in Section III.A.4.f represents the best current knowledge of the existing environment. The discussion acknowledges that air temperatures over the Arctic Ocean have increased over the last 50 years. Changes in the global climate are having an effect on arctic sea ice. However, the effects of short-term variations can be significant and should not be ignored.

CBD 015-008

Details on the scientific understanding of global climate change are best treated at the programmatic level, rather than for a specific lease sale. A comprehensive discussion is found in the final EIS for the OCS Leasing Program 2007-2012. This document presents the best available current information about global climate science.

CBD 015-009

A discussion regarding the adoption of a greenhouse gas level “ceiling” is far beyond the scope of the EIS. Such a limit can only be discussed in the context of a policy at the national level involving all energy sectors.

CBD 015-010

See the response to comment **CBD 015-008**.

CBD 015-011

See the response to comment **CBD 015-008**.

CBD 015-012

We do not have enough confidence in the cost figures published in the literature to make any estimate of the economic costs of greenhouse gas emissions, nor is the issue in the scope of this EIS. Furthermore, the effects of the proposed lease sale on overall U.S. energy consumption are not known.

CBD 015-013

See the response to comment **CBD 015-012**.

CBD 015-014

See the response to comment **CBD 015-012**.

CBD 015-015

This analysis focuses strictly on mitigating the potential, specific impacts associated with the Proposed Action. Mitigating the impacts of global warming is beyond the scope of this project and this analysis. Section V.C.8.c(3), Climate Change, contains an extensive discussion of the potential and actual impacts on polar bears from climate change.

CBD 015-016

See the response to comment **CBD 015-015**.

CBD 015-017

For a discussion of the impacts of global climate change on subsistence resources and practices, sociocultural systems, and environmental justice, see Sections V.C.12, Subsistence-Harvest Patterns, and V.C.16.d., Cumulative Climate Change Impacts, and the response to comment **Barrow 003-029**.

CBD 015-018

For a discussion on the impacts of global climate change on human society and human health, see response to comment **CBD 015-017**. For a discussion of MMS's recent dialogue with the NSB and the Alaska Inter-Tribal Council on human health impacts, see responses to comments **Point Lay 001-008**, **Barrow 003-017**, **NSB 006-005**, and **NSB 006-011**.

CBD 015-019

See the response to comment **CBD 015-018**.

CBD 015-020

While MMS appreciates the fact that global warming and greenhouse gas emissions are linked to a number of phenomena posing threats to elkhorn and staghorn corals, the contribution of the potential recoverable hydrocarbon reserves in the Chukchi Sea, and the contribution of the use of these reserves might make to the collective greenhouse gas emissions and global warming, is unknown or speculative, and extremely small. The status of these species of coral at such time that Chukchi Sea reserves initially would be consumed and begin to contribute to greenhouse emissions is speculative and depends on a host of factors beyond the scope of the Proposed Action.

Upon initiation of Section 7 consultation with the FWS in the letter dated December 13, 2005, MMS specifically requested, in addition to the species listed therein, that FWS notify MMS with the FWS "concurrence with, or necessary revisions to, the above species and add any critical habitats which you believe would need to be considered in any biological evaluations related to the MMS proposed action…." A similar request was made of NMFS in a letter dated August 12, 2005. The FWS responded in a letter dated January 5, 2006 (note the letter in the draft EIS is January 5, 2005), with no revision or addition of the elkhorn and staghorn corals or their habitats to be evaluated within the scope of the Proposed Actions. The NMFS response dated September 30, 2005, did not include any references to staghorn and elkhorn coral. This would reasonably be understood to mean that the Proposed Actions are not likely to jeopardize the continued existence of elkhorn or staghorn coral or any listed species except the species specifically identified for biological evaluation by FWS and NMFS.

The conclusion is that MMS did initially consult and request any other species of concern for a biological evaluation with the appropriate agencies. The elkhorn and staghorn corals were not forwarded to MMS by the appropriate agencies for further evaluation or assessment in regard to the Proposed Actions.

Section 2, Findings, Purposes, and Policy of the ESA are broad. Section 2 (a)(4) FINDINGS notes: "the United States has pledged itself as a sovereign state in the international community to conserve to the extent practicable the various species of wildlife and plants facing extinction…"—emphasis on "to the extent practicable." Section 2 (b) Purposes notes: "The purpose of this Act are to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved"—emphasis on "means" and may be conserved.

Section 2 (c) POLICY states: "…all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this ACT." The MMS appears to be in compliance with the items in Section 2 of the ESA. The FWS and the NMFS exercised through their agency protocols what is regarded as "to the extent practicable" in reference to forwarding to MMS the coral species noted and other listed species and provided MMS with the appropriate lists for biological evaluation.

Section 9 of the ESA is titled PROHIBITED ACTS. Section 9(a)(1)(B) deals with taking of endangered or threatened species within the United States or the territorial sea of the United States and (C) the same for taking on the high seas. It is difficult to correlate potential greenhouse gas emissions from potential hydrocarbons in the Chukchi Sea at some point in the future to specific loss (taking) of species currently 90% depleted and which could be functionally extinct before Chukchi Sea source greenhouse gases enter the global atmosphere system. The uncertainty and significance of the eventual results of the Proposed Section regarding taking of elkhorn and staghorn coral would appear to be impracticable and may not interpreted as be a violation of Section 9 of the ESA at this time.

CBD 015-021

See the response to comment **CBD 015-020**.

CBD 015-022

The MMS initially consulted and requested any other species of concern for a biological evaluation with the appropriate agencies. In our initiation of Section 7 consultation with the FWS in the letter dated December 13, 2005, MMS specifically requested, in addition to the species listed therein, that FWS notify MMS with the FWS "concurrence with, or necessary revisions to, the above species and add any critical habitats which you believe would need to be considered in any biological evaluations related to the MMS proposed action…." Similar request was made of NMFS in a letter dated August 12, 2005. The elkhorn and staghorn coral were not forwarded to MMS by the appropriate agencies for further evaluation or assessment in regard to the Proposed Actions. Please also see the response to comment **CBD 015-020**.

Document 16

Comment summaries submitted by Dr. Wernham as associated with the North Slope Borough

Generally, employment opportunity is viewed positively by NSB residents. However, to the extent that employment may sometimes conflict with the traditional subsistence seasonal round and thus the family and kinship sharing networks, increased employment could actually result in some disruption of sociocultural systems, and in this way be a source of stress and conflict in the community. Some data has suggested that increasing employment in Inupiat communities is, paradoxically, associated with a trend toward decreased measures of satisfaction. **(016-001)**

To the extent that disruption of sociocultural systems may be associated with increases in social pathology as discussed in "health effects" below, an increased demand on law enforcement and health services may occur, particularly in Barrow and Wainwright. Compounding this is the risk that as these communities become functionally less isolated through increased air travel and the construction of ice roads, illicit importation of drugs and alcohol may occur, also creating increased demand on law enforcement and health services. This problem has been described in testimony by residents of Nuiqsut after the construction of the Alpine facility began. **(016-002)**

Although Wainwright has experienced immigration of workers in the past, it is difficult to predict what level of sociocultural effects might accrue from the potential influx of permanent or temporary non-Native workers under the development scenario, given the other changes possible under currently predicted North Slope development. **(016-003)**

However, there are no existing restrictions on subsistence hunting by non-Native residents. And with any influx of non-Native personnel to a relatively isolated, predominantly Native community, the risk of sociocultural stress and change, associated with factors such as acculturation through increased contact with an outside culture, increased access to drugs and alcohol, sexual relationships between workers and residents, and perceived inequities in employment opportunities and income, may accrue. Hence, although we do not predict a large adverse sociocultural effect as a result of any influx of new residents, the potential for impacts exists. **(016-004)**

In particular, hiring and employment practices which value and facilitate continued participation in the subsistence seasonal round are encouraged by the NSB and local residents. **(016-005)**

A range of human health issues – including shortened lifespans among elders from degradation of air quality; increases in social pathology including drug and alcohol abuse, domestic violence, rape, child abuse, suicide and homicide, increases in respiratory problems, and increases in injuries because of more difficult subsistence conditions – have been raised but not analyzed in detail in these EIS. Additionally, cumulative subsistence impacts have also been raised, without discussion of the implications for metabolic health as we have delineated above. **(016-006)**

MMS Responses to Dr. Wernham's Comments

Wernham 016-001

The text has been changed to reflect the paradox cited in the comment and to provide citations from Kruse (1984), which examined the relationship between Inupiat labor, subsistence-harvest activities, and measures of economic and social well-being and URS (2005), which indicates wage employment can facilitate subsistence-harvest activity.

Population in many NSB communities declined with the completion of capital improvement projects, as some residents left to find employment. Outmigration continues to be a concern expressed in many of the villages. Retaining jobs in the community would contribute to stabilizing the population, slow the rate of population decline, and increase the stability of the community in the short term. To the extent that residents of Wainwright are able to secure employment at the nearby supply base, this should be the case. Table IV.C-1 indicates employment opportunities for NSB residents will not be sizeable.

As noted in table IV.C.-2, Workforce Changes, removal of harvesters and trained individuals from a community are variables examined under sociocultural systems. Wage employment appears to strengthen rather than weaken subsistence harvest activities. A recent study prepared for the NSB (URS, 2005) cites an earlier study to note that the cash economy has not displaced the subsistence economy, and that wage earners carry out subsistence activities. Wage earners contribute money to support subsistence activities and help ensure the provision of subsistence foods to the entire community. The report states that it is very common for a family member to work and monetarily sponsor someone else in their subsistence pursuits. A sponsor receives a measure of status and also part of the catch for assisting the hunt.

Wernham 016-002

The scenario indicates that until the airfield at the assumed shore base is completed, air service would be provided through Wainwright and Barrow. The importation and sale of alcohol is banned at Wainwright. Company policy generally prohibits possession and consumption of alcohol in enclaves. The text is changed to reflect that enforcement activities by public safety officers at the originating Alaska airports, such as Anchorage and Fairbanks, and at Wainwright by NSB Police would increase with the frequency of flights in proportion to the rate that this surveillance is currently conducted. These enforcement activities at Wainwright would cease with transfer of air operations to the shore base airfield. (Importation of alcohol is not prohibited in Barrow.) Stipulation 2, Orientation Program, is intended to "increase the sensitivity and understanding of personnel to community values, customs, and lifestyles." To the extent that this information includes notification of the prohibition on the importation of alcohol, the stipulation helps avoid the problem. Similarly, if this issue is included under Community Participation in Operations Planning encourage by ITL clause no. 1, it could also contribute to the avoidance of the problem.

Wernham 016-003

The text has been changed to differentiate between effects that may result from new residents and those that may result from nonresident workers.

Table IV.C-1, Sale 193 Employment and Personal Income Effects, projects that a total of 30 direct, indirect, and induced jobs would be created across the NSB from the development activities envisioned by the hypothetical scenario, and a total of 11 direct, indirect, and induced jobs across the NSB by production activities. Given that some of these positions may be filled by current NSB residents, and other factors, we do not envision an influx into the community that would cause disruption.

Community involvement in operations planning and development and current information on the experience of other NSB communities with oil and gas activities may help reduce disruption.

Wernham 016-004

Non-native subsistence hunting is restricted. For example, non-Native hunters are not allowed to hunt marine mammals.

Table IV.C-1, Sale 193 Employment and Personal Income Effects, projects that a total of 30 direct, indirect, and induced jobs would be created across the NSB from the development activities envisioned by the hypothetical scenario and a total of 11 direct, indirect, and induced jobs across the NSB by production activities. Given that some of these positions may be filled by current NSB residents, and other factors, we do not envision a large influx of people into the community. The paragraph has been changed to include the employment estimate and the concluding sentence changed to indicate that an influx of new residents from development and production-related employment would be expected to have little direct and indirect consequences to sociocultural systems.

We do include concerns in the cumulative effects analysis by summarizing effects described by previous analyses in Section V.C.13.a. Please see the response to comment **Wernham 016-006**.

Wernham 016-005

The section has been changed to incorporate this information.

Wernham 016-006

Some issues raised in scoping are not analyzed in detail in the EIS's because they have been addressed in other EIS's, they are not substantive, or they are speculative; that is, a causal link between the Proposed Action and the effect has not or cannot be demonstrated. This EIS addresses these effects to the extent that they are linked to the Proposed Action, either directly or indirectly. The many EIS's listed in Section V.C.13.a do examine these issues, so we summarize the information as required by NEPA. We have added another citation (USDOI, BLM, 2004b, Alpine Satellite Development Plan Final EIS) and summary information on community health and welfare (from Sec. 3, page 289 to 290, of the Alpine EIS) to Section V.C.13.a.

Document 17 is found in the Federal and State Agency Comment Letter s Section

Document 018

March 16, 2007

Regional Director John T. Goll,
Alaska OCS Region, Minerals Management Service
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5820

Dear Alaska Regional Director Goll,

Thank you for this opportunity to comment on the Environmental Impact Statement (EIS) for the proposed Chukchi Sea Lease Sale 193. The proposed plan for drilling and exploration in the Chukchi Sea presents serious threat to the marine ecosystem and disproportionate impacts upon communities dependent on subsistence resources in the region. We oppose the proposed seismic exploration and oil and gas development in the Chuckchi Sea and believe Lease Sale 193 should be cancelled and permanent protections enacted for America's Arctic.

The Minerals Management Service (MMS) has provided little baseline data upon which to justify the impacts of seismic exploration and oil and gas development. Indeed, the proposed EIS represents more of a "threshold assessment" rather than a meaningful analysis of the potential environmental effects of Lease Sale 193. Little is known about the resources of the Chukchi Sea, and MMS must conduct adequate baseline studies before the Secretary can reasonably consider whether oil exploration and development are appropriate. Moreover, no oil spill response technology exists to effectively remediate an oil spill during conditions present in the Chukchi during most of the year. We believe the EIS contains insufficient analysis in the following areas:

A. Cumulative Effects

i. General

NEPA requires that the EIS take a hard look at the cumulative impacts on the environment of activities occurring pursuant to Lease Sale 193. 40 C.F.R. § 1502.1; 40 C.F.R. § 1508.7. Cumulative impacts result "from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions," and "can result from individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7. The DEIS fails to do so in several respects.

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ii. New Technology as Mitigation

The cumulative effects analysis asserts that new technology will mitigate the effects of widespread development on the North Slope and the Arctic Ocean. This assumption presents a significant logical gap. First, new technologies often fail to fulfill their promises. For instance, it was shown during the Exxon Valdez disaster that the "new technique" of using high pressure hoses and hot water to remove oil from beaches and direct it into shoreside skimmers may have actually caused more harm than good by driving the oil deeper into the shoreline gravel. Second, the production and effectiveness of new technology for oil and gas development is inherently uncertain. Reliance on technology must be based on existing technology, not science fiction. Thus, the assertion that new technology will mitigate the effects of development does not actually address the cumulative impacts, but merely asserts that an unknown will address the cumulative impacts at an uncertain time. This type of hollow analysis fails to meet the goals of NEPA to inform the public. 018-001

iii. Future Oil Development

Furthermore, the cumulative effects analysis omits consideration of future oil activities from the aggressive leasing plan currently underway in the Beaufort Sea. MMS admits in the EIS that that development in the Chukchi would likely encourage a greater level of activity in the Beaufort Sea. DEIS at IV-1. This activity could have serious impacts on resources such as walrus, polar bears, and the bowhead whales that use both the Chukchi and Beaufort Seas. Migrating whales could be exposed to significant additional noise resulting from construction, shipping, and seismic operations related to development. Additionally, noise and structural disturbance of exploration and development could have substantial impacts on polar bears and walruses by affecting their feeding and breeding habits. The DEIS fails to sufficiently analyze the cumulative impacts of noise. 018-002

Moreover, activities in the Beaufort and Chukchi could expose resources to multiple oil spills. The 5-year Plan DEIS states that up to 5 large spills are assumed to occur from OCS activities in the Alaska OCS. The Lease Sale 193 analysis must address the cumulative and compounding effects of multiple spills in the Chukchi and Beaufort Seas. 018-003

iv. Climate Change

The analysis fails to acknowledge the cumulative impacts associated with climate change. Climate change represents one of the most serious threats to arctic resources and cannot be ignored as it relates to the proposed seismic exploration and oil and gas development in the Chukchi Sea. Climate change could completely alter the ecology of the arctic, resulting in significant acute effects on individual species and considerable population level effects among various species. Moreover, climate change could have substantial impacts on subsistence, beyond the population level effect it could have on various species. Increasing arctic temperatures and associated physical effects could compound the impacts of seismic exploration and oil and gas development. MMS must also more carefully consider the cumulative effects of 018-004

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the loss of sea ice habitat for wildlife species, such as polar bears and walrus. The effect of distribution of subsistence species altered by offshore development activities combined with the effects of climate change on subsistence needs to be discussed in the cumulative impacts analysis.

In assessing the likely effects of climate change, the EIS also should consider the following sources: Pew Center on Global Climate Change. Observed Impacts of Global Climate Change in the U.S. (Nov. 9, 2004), U.N. Environment Programme, GEO Year Book 2004/5: An Overview of Our Changing Environment 42-46, 80-84 (2005), National Academy of Sciences, Joint science academies' statement: Global response to climate change (June 7, 2005), The Wildlife Society, Global Climate Change and Wildlife in North America (2004), available at http://www.nwf.org/nwfwebadmin/binaryVault/Wildlife_Society_Report2.pdf, and Millennium Ecosystem Assessment, Millennium Ecosystem Assessment Synthesis Report 119 (Mar. 23, 2005), available at http://www.millenniumassessment.org/en/products.aspx (last visited Nov. 16, 2006). MMS should also consider the findings of the Arctic Climate Impact Assessment conducted by Arctic Council and the International Arctic Science Committee (IASC) and found at (http://www.acia.uaf.edu/pages/scientific.html). Furthermore, the paper "A Major Ecosystem Shift in the Northern Bering Sea" by Jacqueline M. Grebmeier and James E. Overland describes additional issues that MMS should consider regarding fishery and other wildlife resources when addressing cumulative effects in the Chukchi Sea. 018-005

B. Information Quality Act

No statement in the EIS addresses its sufficiency under the Information Quality Act (IQA; P.L. 106-554). The science underlying any policy decisions in the EIS must meet the quality, objectivity, utility, and integrity standards required under the IQA. Additionally, this EIS is a Natural Resource Plan that must be subject to the peer review requirements under the IQA. It appears that the EIS would meet the narrative criteria of "novel, controversial, precedent-setting or of significant interagency interest" for establishing the EIS as a "highly influential scientific assessment." As a highly influential scientific assessment, the document must undergo substantial and rigorous peer review before release to the public. At a minimum, the EIS meets the "influential" standard of having a "clear and substantial impact on important public policies or private sector decisions" for peer review under the IQA. As an influential scientific assessment, peer review must be conducted commensurate with the significance of the information being disseminated and the likely implications for policy decisions, which in this case is considerable. MMS must address the requirements of the IQA in this action. 018-006

C. Subsistence and Cultural Resources

Alaska Native communities have long used the marine resources of the Chukchi Sea for both subsistence practices and cultural identity. Although MMS recognizes the importance of the resources to these communities, the agency has failed to adequately address the disproportionate impacts of Lease Sale 193 on these communities. MMS has also failed to adequately consult with the Alaska Native tribes as required by the Executive Order (EO) 12898, Federal Actions to 018-007

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Address Environmental Justice in Minority Populations and Low-Income Populations and accompanying Presidential memorandum (1994), or Executive Order 13175, Consultation and Coordination With Indian Tribal Governments (2000). While MMS does address Executive Order 13175, MMS must make the tribal summary impact statement available to the public as part of the analysis, including the description of the extent of the agency's previous consultation with tribal officials, summary of the nature of their concerns and the agency's position supporting the need to issue the decision, and a statement of the extent to which the concerns of tribal officials have been met. DEIS I-8, III-128. Without this level of transparency, the public, especially the native community, cannot be assured that the spirit or intent of these Executive Orders has been met. 018 007 (CONT)

Moreover, MMS understates the effects of a loss of subsistence resources in an area with limited infrastructure and commercial food availability. A complete loss of marine subsistence resources for one or more seasons resulting from a large spill could result in the displacement, if not starvation, of hundreds of Alaska Natives who depend on subsistence resources for sustenance. No "positive mitigating effect" can account for a complete loss of these subsistence resources from a cultural and sociological perspective. Furthermore, whenever the potential exists for the take of a subsistence resource to fall below the level required to meet subsistence need for a season, the effects must be considered significant and adverse. MMS must more carefully consider the impacts of seismic exploration and oil and gas development on subsistence communities. 018-008 018-009

D. Marine Mammals

Lease Sale 193 appears to contravene the basic purpose of the MMPA, which is to prevent marine mammal populations from diminishing "below their optimal sustainable population." 16 U.S.C. § 1361(2). Because the affected populations of walrus and polar bears are already declining, any additive impacts to the populations will interfere with subsistence harvest. As previously noted, the cumulative impacts section fails to adequately address these potential additive impacts. Therefore, the MMPA may provide leverage to challenge future authorizations for Alaska Native harvest issued by Fish and Wildlife Service to incidentally take these species in the Chukchi Sea. See 16 U.S.C. §§ 1371(a)(5)(A)(i)(I), (a)(5)(D)(i)(II). Moreover, it seems disingenuous to suggest that seismic exploration and oil and gas development following the sale will not discernibly reduce the size of polar bear or Pacific walrus populations or depress subsistence harvest levels. 018 010 018 011

i. Polar Bears

a. The Status of Affected Polar Bear Populations:

The DEIS describes the Chukchi/Bering Seas ("CBS") polar bear population as being "in peril." DEIS at III-81. The available evidence, including declining subsistence harvests, indicates that the CBS polar bear population is "already in decline" and that existing levels of legal harvest and

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poaching in Russia alone could halve the CBS population in less than twenty years. *See* DEIS at IV-240, III-81.

As the DEIS recognizes, anthropogenic climate change has already begun to fundamentally alter the Arctic environment. Along with over harvest of CBS polar bears, climate change will synergistically interact with the impacts of increasing oil and gas activities in the Arctic marine and coastal environments to adversely affect the CBS and Southern Beaufort Sea ("SBS") polar bear populations into the foreseeable future. Accordingly, the DEIS concludes that "[a]ny bears lost to a large oil spill . . . likely would exceed sustainable levels, affecting both productivity and subsistence use, and potentially causing a decline in the bear population." DEIS at IV-239. This conclusion applies equally to bears lost due to any activity related to oil and gas development. The DEIS should explicitly acknowledge this. 018-012

The DEIS presents incomplete and inaccurate information concerning affected polar bear populations. First, the DEIS overstates both the population estimate and the population growth rate for the SBS polar bear population. Compare DEIS at III-82 with Eric Regehr, *et al.*, Polar bear population status in the southern Beaufort Sea: U.S. Geological Survey Open-File Report 2006-1337, 12 (2006). In addition, the DEIS assumes unrealistic survival rates for polar bear cubs of the year and yearlings, and consequently overstates the rate of recruitment. *See* DEIS at III-78, IV-240. Researchers recently estimated a survival rate for cubs of the year in the SBS population that is considerably lower than the 50-60% recruitment rate reported by the DEIS. *See* Eric Regehr, et al., Polar bear population status in the southern Beaufort Sea, 11. This recent report represents the best available scientific data on the population dynamics of polar bear populations in Alaska, and MMS should incorporate the findings of this report into the EIS. Because the CBS polar bear population faces the added threats of over harvest in Russia, the survival and recruitment rates estimated for the SBS should serve as upper limits for these parameters for the CBS population. 018-013

b. Informational and Analytical Gaps

Despite the current precarious status of the CBS and SBS polar bear populations, the DEIS arbitrarily concludes that the impacts from activities undertaken in connection with Lease Sale 193 will be "slight." DEIS at IV-234. Any additive mortality may reduce reproductive rates, diminish the availability of polar bears for subsistence uses and cause the affected population to decline. At present, polar bears in the Chukchi Sea exist relatively free from the harmful effects of industrial activities. Anticipated impacts from industrial activities associated with Lease Sale 193 will add to the variety of stressors that currently deteriorate polar bears' physical health. This, in turn, may cause additional mortality to a population that is already declining. 018-014

The DEIS does discuss the potential impacts to the CBS polar bear population caused by changes to the Arctic environment attributable to climate change, but it fails to include the documented impacts to the SBS population caused by climate change, such as reduced recruitment rates and diminishing physical stature of polar bears. *See* Eric Regehr, *et al.*, Polar bear population status in the southern Beaufort Sea. This information is pertinent to a thorough and complete 018-015

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evaluation of the impacts of Lease Sale 193, because individuals from the SBS population spend considerable time in portions of the Chukchi Sea that MMS intends to offer for leasing. *See, e.g.*, Steven Amstrup, Movements, distribution, and population dynamics of polar bears in the Beaufort Sea (PhD Dissertation, University of Alaska-Fairbanks, 1995). The EIS should discuss the documented impacts of climate change on SBS polar bears and should take steps to avoid exacerbating these impacts.

018-015 (CONT)

The DEIS identifies coastal areas along the coast of the Beaufort Sea that have the highest densities of maternal den sites, but does not include similar information for the Chukchi Sea. This information is highly pertinent to the possible impacts that aircraft overflights, an onshore facility, and an onshore pipeline may have on CBS polar bears, and it should be included in the EIS. If MMS is unable to obtain this information, the EIS should provide a detailed summary of the existing credible evidence concerning polar bear denning habitat along the Chukchi coast. *See* 40 C.F.R. § 1502.22(b).

018-016

c. Mitigation measures

NEPA demands that an agency take a hard look at mitigating measures when discussing the environmental consequences of a proposed project. *See* 40 C.F.R. § 1502.16. Pursuant to this standard, an EIS may not merely list, or only perfunctorily describe mitigation measures. Rather, the EIS should critically evaluate the effectiveness of proposed mitigation measures.

The DEIS fails to sufficiently identify or evaluate mitigation measures aimed at protecting polar bears. Rather than identify any particular mitigation measures with specificity, the DEIS adopts the approach of referring to mitigation measures in very general terms, grouping them under the following three broad categories: (1) conditions attached to incidental take authorization that Fish and Wildlife Service will issue pursuant to §101(a)(5) of the Marine Mammal Protection Act; (2) oil spill response plans ("OSPRs") that MMS will approve; and (3) information to lessees ("ITL") provisions that have been developed by MMS. DEIS at IV-241–45. This generalized discussion of mitigation measures deprives the public of a meaningful opportunity to comment on the desirability of these measures. Because many of these identified measures have not yet been developed and so cannot be identified with specificity or discussed in any detail (e.g., conditions to incidental take authorization and contents of OSRPs), the public cannot accurately assess MMS's conclusory determination that such measures will prove effective. This approach undermines MMS conclusion that the mitigation measures will prevent a significant impact to polar bears and impermissibly defers analysis of identified mitigation measures in violation of NEPA.

018-017

Ultimately, the DEIS concludes that because of the cumulative impacts of overharvest, global climate change and industrial activities, "continued close attention and effective mitigation practices with respect to polar bears are warranted." DEIS at V-52–53. The DEIS does not identify these mitigation practices with specificity. Nor does the DEIS establish that any previously identified mitigation measures are effective or will continue to be so in the context of

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a dramatically changing arctic environment. In short, the DEIS fails to evaluate or identify these necessary mitigation measures.

018-019

The DEIS identifies future increases in polar bear-human conflicts as a concern arising from industrial development along Alaska's arctic coast. DEIS at IV-235, III-79. Such conflicts can prove lethal to polar bears. MMS fails, however, to suggest any mitigation measures to address this anticipated impact.

018-020

To the limited extent that the DEIS actually identifies specific mitigation measures, these prove deficient to adequately address and avoid anticipated impacts to the CBS polar bear population. MMS relies on OSRPs to minimize adverse impacts from oil spills. Any such response plan depends on timely detection of oil spills. MMS indicates that recently, chronic leaks in oil pipelines have gone undetected despite MMS regulations that require monitoring measures. MMS observes that its regulations "are only as effective as their enforcement." DEIS at IV-244. Yet, the DEIS fails to prescribe measures to ensure improved enforcement of MMS monitoring regulations.

MMS's apparent assumption that lessees will be able to effectively respond to oil spills is not factually supported. The DEIS indicates that "effective mitigation measures will be developed" to minimize potential impacts to polar bears "on a case-by-case basis." DEIS at IV-245. MMS identifies two methods of response to an oil spill: mechanical methods and non-mechanical methods. MMS anticipates that mechanical methods will be unavailable during broken ice periods (or during the majority of any calendar year), yet the DEIS identifies only in situ burning as a non-mechanical method for containing or eliminating spilled oil. In situ burning will not prove effective if spilled oil is trapped beneath sea ice for any appreciable period of time. Indeed, MMS fails to present any means of effectively responding to oil that is spilled beneath sea ice. If MMS lacks any such means, it should openly acknowledge this. If MMS is aware of an effective method for responding to oil spilled beneath sea ice, the EIS should clearly identify it and establish its effectiveness. Absent identification of an effective method of responding to an underwater oil spill that occurs during the winter, MMS cannot reasonably conclude that the potential impacts to polar bears from an oil spill are not significant.

018-021

The DEIS identifies several ITLs as mitigation measures. Critical provisions of these ITLs, however, contain precatory language rendering them effectively unenforceable. The ITLs cannot, as MMS seems to suggest, moderate the impacts of offshore oil and gas leasing and development in the Chukchi Sea unless lessees voluntarily act in accordance with the ITLs. MMS arbitrarily assumes that lessees will voluntarily abide by the guidance included in the ITLs. MMS likewise assumes that lessees will obtain authorization to incidentally take marine mammals, and subject themselves to the consequent conditions imposed by Fish and Wildlife Service. MMS neglects, however, to establish that such an approach would prove economically rational for all lessees. The DEIS improperly relies on these mitigation measures in violation of NEPA.

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The DEIS suggests that whale carcasses should be removed from the coast to mitigate the potential impacts of an oil spill. DEIS at IV-245. MMS' reliance on this measure to reduce impacts to polar bears is misplaced. Any such action is not within the purview of MMS to effectuate and should not be relied on by the agency as an effective mitigation technique. Furthermore, removal of whale carcasses will likely have the countervailing effect of increasing the mortality of polar bears in the SBS and CBS populations. If accomplished, it will deprive bears of access to a vital food source during the fall, when bears have minimal access to alternate food sources. Preventing bears from utilizing this important food source will diminish the physical condition of individual bears and may lead to increased mortality. 018-022

d. Cumulative Impacts Analysis

The DEIS fails to adequately assess the cumulative impacts of offshore oil spills on polar bears. The DEIS only refers to the truncated discussion of the potential for an oil spill included in the environmental assessment prepared by MMS in connection with Lease Sale 202 in the Beaufort Sea. DEIS at V-49. That document, in turn, fails to rigorously evaluate the likelihood of an oil spill occurring as a result of past or future lease sales, indicating merely that "[d]evelopment of additional offshore production facilities and pipelines will increase the potential for large offshore spills." MMS, Environmental Assessment for Proposed OCS Lease Sale 202, 55 (August 2006). Instead of segmenting the risk of an offshore oil spill by discretely referring to the risk of a spill in the Beaufort Sea, the EIS should combine the probability of a spill in the Chukchi with the probability of a spill in the Beaufort and present an additional figure representing the overall probability of a large offshore oil spill. Moreover, the DEIS should account for all past, present, and reasonably foreseeable future lease sales in the Chukchi and Beaufort Seas when deriving these combined probabilities, including all lease sales provided for by the proposed five year plan for OCS lease sales (2007-2012). See 40 C.F.R. § 1508.27(b)(7). 018-023 018-024

The DEIS overlooks the potential impacts of past, present and reasonably foreseeable future onshore leasing, exploration and development of oil and gas deposits in coastal areas of the National Petroleum Reserve-Alaska in violation of NEPA. Such development has the potential to further exacerbate human-polar bear conflicts during the fall when bears congregate along the coast of the Chukchi Sea, as well as to adversely affect polar bears' terrestrial denning habitat. The EIS should address these cumulative impacts. 018-025

Finally, the DEIS arbitrarily concludes that the combined impacts to polar bears from climate change and oil-related industrial activities merit only "continued close attention and effective mitigation practices." DEIS at V-53. Climate change induced changes are already evident in polar bear populations in Alaska and elsewhere. *See, e.g.*, Eric Regehr, *et al.*, Polar bear population status in the southern Beaufort Sea. The DEIS forecasts additional impacts to "virtually every aspect" of polar bears' existence as a result of the synergistic interplay between climate change and industrial activity in the Arctic. DEIS at V-52. The DEIS overlooks the dramatic changes to the Arctic marine environment that have already adversely affected polar bear populations in Alaska. Consequently, the DEIS improperly adopts a "wait and see" approach to restricting offshore oil and gas activities that will further harm polar bears. 018-026

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Moreover, the DEIS relies on "effective mitigation practices" without specifically identifying these measures or critically evaluating them to ensure that they are effective or will remain so in the future. DEIS at V-53. Pursuant to NEPA, the EIS may not rely on these unspecified, unimplemented, and unproven mitigation measures to reduce identified impacts. 018-027

ii. Pacific walrus

The Pacific walrus population is presently in decline. Population declines have contributed to declining subsistence harvest of Pacific walrus. Oil and gas industry activities in the Chukchi Sea, including seismic activities, aircraft and vessel traffic, and the risk of oil spills may inhibit walrus recovery or may cause further decline of the Pacific walrus population. MMS should take steps to stem further declines in walrus populations and the subsistence harvest of walrus.

The EIS should identify those areas where the edge of sea ice frequently occurs over waters less than 60 m deep. Information available from existing sources produced by the USGS and found at (http://www.absc.usgs.gov/research/walrus/pwid/manager.html) could easily be incorporated into a GIS representation of these important walrus habitat areas. The risk posed to Pacific walrus by spilled oil is especially acute in such areas, see DEIS at III-71, and such areas should be specifically discussed and illustrated in MMS's evaluation of the potential risk from an oil spill. The EIS should prescribe measures to eliminate such risks. 018-028

The DEIS arbitrarily concludes that seismic activities will only negligibly affect Pacific walrus. Much of the very information that MMS provides suggests that the cumulative effects of climate change and proposed oil and gas development would be substantially more than negligible by any standard. MMS must more clearly describe their reasoning why a continuing decline in the population combined with inevitable impacts from development is negligible. 018-029

Likewise, the DEIS arbitrarily concludes that Pacific walrus in sea ice habitats will not react to aircraft at elevations above 1,000 feet. It does not indicate any elevation threshold above which Pacific walrus at terrestrial haulouts will not react to aircraft. Terrestrial haulouts have become increasingly important to western arctic populations of Pacific walrus and likely will become more important in the Chukchi Sea with decreasing and irregular ice formation resulting from climate change. MMS recognizes that when suitable pack-ice is not available walrus haul out to rest on land. DEIS III-72. However, MMS fails to adequately address the fact that disturbance events, such as overflight by aircraft, can cause walrus to stampede into the water. The risk of stampede-related injuries and mortalities increases with the number of animals hauled out and the frequency of disturbance. Calves and young animals at the perimeter of these herds are particularly vulnerable to trampling injuries, thus increasing juvenile mortality and recruitment. Moreover, any additional displacement of Pacific walrus from forage areas will likely further contribute to declines in the walrus population. Without additional studies of aircraft effects on walrus behavior, MMS cannot expressly conclude there will be no effect on walrus based on the 1,000 foot altitude criteria. Furthermore, unless MMS can establish that industrial activities will have no effect on Pacific walrus in forage areas, it should conclude that such activities will significantly impact Pacific walrus. 018-030

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E. Conclusion

In conclusion, we believe the DEIS provided for Lease Sale 193 fails to adequately address the sensitive ecosystems and unique communities of the Chukchi Sea. We believe the only alternative that should be considered for the Chukchi Sea is Alternative II (No Lease Sale) and cancellation of Sale 193. The U.S. must adopt a responsible energy policy that does not rely upon uncertain and unproven fossil fuel deposits in America's Arctic as a short-term fix to our oil addiction. According to MMS, the most liberal accounting of oil and gas projected for the combined North Slope, Beaufort Sea, and Chukchi Sea amounts to only 17.8 Bbbl, which at the current estimated US consumption levels of 20.5 Mbbl per day would amount to approximately 2.4 years worth of available oil. The U.S. imports more than 11.8 Mbbl per day. Thus, it would be a complete fallacy to say that opening the Chukchi Sea gets the U.S. any closer to energy independence. MMS must cancel this lease sale, the U.S. must reduce its consumption of fossil fuels, and we must enact permanent protections for America's Arctic ecosystems.

Sincerely,

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MMS Responses to World Wildlife Fund Comments

WWF 018-001

While the EIS asserts there will be improvements in both pollution prevention and response equipment, this in no way precludes the effective use of existing technologies for either of these areas of endeavor. The MMS conducts an active oil-spill-research program to further help the development of new and improved technologies designed to prevent spills and to clean up spills should they occur. This program is mandated and funded through provisions of the Oil Pollution Act of 1990.

Through the oil-spill-response research program we have addressed issues that were raised from the *Exxon Valdez* spill and others around the world. Recently funded research has resulted in an oil skimmer with a new surface design that has increased recovery of oil by over 200%; research using ground penetrating radar to detect oil located in and under ice has proven highly effective and work continues to develop an airborne version that will speed detection in the event of a release; research conducted on in situ burn has resulted in better identifying the parameters for conducting successful burns that have the potential to dramatically reduce oil on the water surface and thereby limiting impacts to the environment (http://www.mms.gov/taroilspills/). Based on this information, our assertion that improved technology will exist to help mitigate spill effects is a safe assumption.

The MMS also provides for an extensive regulatory review of planned operations to ensure that the safest and most appropriate technology is used to prevent a spill from occurring in the first place. The MMS reviews an operator's proposal prior to giving any approvals to drill for oil or gas. The MMS also has a Technical Assessment and Research Branch, which evaluates new technologies for safety aspects as well as appropriateness for use in the environments they are proposed for. This attention to the details of any proposed operation provides for a safe and pollution free operation.

WWF 018-002

The cumulative effects analysis does not omit consideration of future oil activities from the leasing plan currently underway in the Beaufort Sea. As explained in Section V.B.3, we include onshore and offshore future lease sales in Alaska and on Federal lands. The cumulative scenario includes potential exploration activities as a result of these lease sales, but does not include speculative production activities for the reasons explained in Section V.B.3. As described in Sections V.B.3 through V.B.9 and as shown in Table V-5, we do include in the cumulative effects analysis the production of resources that have been discovered and whose development and production is reasonably foreseeable. As such, the cumulative analysis accounts for the entire range of effects from noise and structural disturbance from these projects. We have added text in Section IV.A to clarify how development in the Chukchi Sea OCS might influence the level of future activity in the Beaufort Sea. Such influence is highly speculative at this time, as there are currently no proved commercial quantities of oil or gas resources in the Chukchi Sea Planning Area. As explained in Section V.B, speculative activities are not included in our cumulative case analysis.

WWF 018-003

Table IV-17 of the 2007-2012 5-Year Program EIS (USDOI, MMS, 2006c) shows up to five large spills ($\geq$1,000 bbl) in the Alaska OCS are assumed for the cumulative case analysis. The table shows that three of these spills are assumed for the Arctic subregion, one spill is assumed for the Bering Sea subregion, and one spill is assumed for the South Alaska (Cook Inlet Planning Area) subregion. This is consistent with the cumulative scenario in the Sale 193 EIS. A likelihood of a spill occurring in either the Bering Sea or South Alaska subregion is remote at this time because of the low level of interest in leasing in Cook Inlet (no industry participation in the last two scheduled sales) and the frontier nature of the gas-prone North Aleutian Basin. For the cumulative analysis, it is not reasonably expected that an OCS spill would occur in either of these areas and impact the same resources that are found in the Arctic subregion.

The EIS fully discusses the potential impacts of spilled oil on the sensitive biological resources and human environment. The risk of one or more large spills occurring in the Chukchi Sea Planning Area and the probability of oil spilled from OCS activities in the Chukchi Sea contacting resources in the Beaufort Sea Planning Area are presented and discussed in Appendix A. The cumulative case scenario includes spills from the both the Proposed Action and reasonably foreseeable Federal and State activities in the Beaufort Sea. Our definition of reasonably foreseeable activities is presented in Section V.B.

The enormous number of potential permutations of multiple spills occurring at different time intervals at different locations and contacting the same resources is beyond the capabilities of the MMS oil-spill-risk model. Evaluating the potential effects of such permutations at the lease-sale stage when the influencing parameters (where development and production occur, what technologies are used, production and pipeline flow rates, and the projected ultimate production volume) are unknown. Further, analysis of such permutations would not vary by alternative and would not help the decisionmaker decide between the alternatives.

WWF 018-004

An analysis of impacts associated with global climate change belongs more properly in an EIS at the programmatic level, rather than in the analysis for a specific lease sale. The final EIS for the OCS Leasing Program 2007-2012 has a discussion of climate change in the section on cumulative impacts (Sec. IV.J).

WWF 018-005

In the final EIS for the OCS Leasing Program 2007-2012, MMS presents a general overview of climate change and its possible future environmental effects. The EIS presents the most essential elements of the current knowledge based on the best available information. It was not possible to cite all of the numerous articles and publications about global climate change. We relied heavily on the 2001 Intergovernmental Panel on Climate Change (IPCC) document because we consider it the most comprehensive and authoritative. For impacts in the Arctic, the MMS cited the Arctic Climate Impact Assessment reports published in 2004 and 2005. These reports provide an exhaustive treatment of possible impacts of climate change on all critical components of the Arctic environment. We included the major findings of *Climate Change 2007: The Physical Science Basis, Summary for Policymakers* published by the IPCC.

WWF 018-006

The MMS agrees that Federal Agencies have an obligation to use and disseminate accurate information and, as required by NEPA and CEQ implementing regulations, to use the best available information in preparing NEPA documents. In preparing the draft EIS, MMS reviewed, considered, and cites hundreds of sources. In addition to peer-reviewed scientific evidence, MMS incorporates consideration of Traditional Ecological Knowledge in preparing EIS's. The draft EIS specifically notes where information is lacking and there is uncertainty in the analysis. In response to comments, MMS has reviewed the literature used in the draft EIS, and the additional references cited by commenters, and has made revisions to the final EIS as appropriate. The MMS disagrees with the statement that "this EIS is a Natural Resource Plan that must be subject to the peer review requirements under IQA."

WWF 018-007

For a discussion on potential disproportionate impacts on Chukchi Sea coastal communities, see the Environmental Justice analyses Sections IV.C.1.p(1), Environmental Justice (effects from the Proposed action) and V.C.16, Environmental Justice (cumulative impacts). Public meetings with Chukchi Sea coastal communities and government-to-government consultation with local tribes in the region are specified and discussed in Section III.B.6, Environmental Justice (the affected environment); this section also has an extensive list of environmental justice issues and concerns raised. Section II of the draft EIS discusses at length the purpose and need for the action, concerns raised in the scoping process, and potential mitigation considered to alleviate potential impacts resulting from the action.

WWF 018-008

The MMS does not believe that OCS activities would cause a loss of subsistence resources that would raise the potential for starvation. Local, Regional, State, and Federal response would preclude such a dire and drastic outcome. Nevertheless, we do believe that a loss of subsistence resources for a single harvest season, particularly those resources normally required to meet subsistence needs, would constitute a significant adverse impact. The MMS approval of industry-proposed activities is conditional upon the operator obtaining appropriate MMPA authorization from NMFS and/or FWS. The MMPA authorization requires the issuing Service to make a finding of no unmitigable adverse impacts to subsistence. Recent MMPA authorizations have included Conflict Avoidance Agreements with subsistence whalers. See also responses to comments **Point Lay 001-008** (mitigation), **Point Hope 002-008** (outreach and government-to-government consultation), and **Point Hope 002-009** (conflict avoidance agreements).

WWF 018-009

Section IV.C.1.p(1), Environmental Justice (effects from the Proposed Action) discusses at length the impacts of seismic activity on subsistence resources and practices in the region.

WWF 018-010

The commenter fails to note that since 1968, there has been only one documented case of a lethal take of a polar bear associated with oil and gas activities in Alaska, and that occurred in 1990. As far as is known, there have been no lethal takes of walruses associated with oil and gas activities in Alaska. Furthermore, although there are no current population estimates for either species in the Chukchi Sea, neither polar bears nor walrus are listed as "depleted" under the MMPA.

The issue of the effects of subsistence harvest on polar bears are covered in depth in Section V.C.8.c(1). If the World Wildlife Fund has specific information regarding interference with subsistence harvest, industrial impacts that have "discernibly reduced" the size of the polar bear or Pacific walrus populations, or "depressed" subsistence harvest levels, MMS would be interested in obtaining those data.

WWF 018-011

See response to comment **WWF 018-010**.

WWF 018-012

The opening paragraph of Section IV.C.1.h(4)(a), Conclusion, has been modified to address the concern.

WWF 018-013

The MMS is aware of the report noted, although it was not available at the time the draft EIS was written. Sections III.B.6.c and IV.C.1.h(4)(e) have been revised to incorporate information from this report.

WWF 018-014

Only one lethal take of a polar bear associated with oil and gas activities has been documented in Alaska. See response to comment **WWF 018-010**, which implies that industrial development in the Alaskan Arctic has proceeded over the last 40 years without apparent impact to polar bear populations.

The World Wildlife Fund is correct to note that any additive mortality may reduce reproductive rates, diminish the availability of polar bears for subsistence uses, and cause the affected population to decline. Furthermore, industrial development of the Chukchi Sea may indeed add to the variety of stressors that

currently affect the polar bear's physical health, which in turn may cause additional mortality to polar bears. The MMS is aware of no studies that establish a direct link between industrial activities and polar bear population dynamics with the exception of potential impacts to maternal polar bear den sites. Any proposed activities that potentially may affect maternal den sites would be carefully reviewed and mitigated by both MMS and FWS to greatly reduce any such potential impacts.

If the World Wildlife Fund is aware of any specific data or research that draw a direct correlation between industrial activities and polar bear population dynamics, MMS would be very interested in them.

WWF 018-015

See response to comment WWF 018-013. The commenter has slightly misrepresented the findings of Regehr, Amstrup, and Stirling (2006). Although climate change is implied as the causative agent of the observed changes in the SBS population dynamics, the authors stopped short of stating that climate change was the *definitive* cause of observed changes. Rather, the authors drew parallels between changes that have been observed in the SBS polar bear population and what has occurred in the Western Hudson Bay polar bear population, stating that:

> …in Western Hudson Bay, Canada, a significant decline in population size was preceded by observed declines in cub survival and physical stature. The evidence of declining recruitment and body size reported here, therefore, suggests vigilance regarding the future of polar bears in the SBS region.

The authors go on to state that:

> In other parts of the polar bear range, reductions in the spatiotemporal availability of sea ice have been shown to negatively impact polar bear stature, productivity, and survival of juvenile, subadult, and senescent animals (Stirling and other, 1999; Stirling, 2002).

The text in the final paragraph of Section V.C.8.c(3) has been revised to incorporate information from this report.

WWF 018-016

The text in Section III.B.6.c., Marine Fissipeds – Polar Bear, has been revised.

WWF 018-017

As stated in Section II.B, ITL No. 14, Information on Planning for Protection of Polar Bears, it is not possible or appropriate at this time to craft specific measures to mitigate potential effects of future activities, because:

> Polar bears are part of a dynamic rather than a static system. Changes in their distributions and populations in recent years indicate that adaptive management is required to adequately mitigate potential impacts to their populations (i.e., specific mitigation measures developed today may not be applicable 5, 10, or 20 years from now). The U.S. Fish and Wildlife Service (FWS) is the management agency responsible for polar bear management; as such, they have the most current information about the status of polar bear populations, the issues facing them, and the most recent research findings applicable to them. Therefore, MMS will be implementing increased coordination with FWS for the protection of polar bears.

The MMS believes it is entirely appropriate to rely on close coordination with FWS to track continued changes in polar bears' distributions and populations to craft project-specific mitigation measures when specific activities are proposed.

Furthermore, MMS believes that FWS's proven track record of effectively mitigating industry activities, via restrictions imposed through their Incidental Take Authorization authority under the MMPA, validates this approach. See responses to comments **WWF 018-010** and **WWF 018-011**.

As far as the ability to assess specific potential future mitigation measures and their effectiveness, the public will be allowed to view and comment on any Incidental Take Authorizations which FWS proposes to issue under the MMPA when they are published in the *Federal Register*, prior to the commencement of any actual industry activities.

Finally, the World Wildlife Fund is encouraged to recommend specific mitigation measures to MMS that they feel will mitigate potential future effects to polar bears. We will be happy to consider them when developing appropriate mitigation measures for future activities.

WWF 018-018

The reader is informed that there is no comment **WWF 018-018**.

WWF 018-019

The commenter is correct that bear-human conflicts can prove lethal to bears. However, that outcome is extremely unlikely for bears entering industrial areas in Alaska's Arctic, as workers are not armed. The MMPA prohibits the arbitrary killing and unauthorized harassment of polar bears. Educating North Slope workers on the issues associated with working in polar bear habitat is adequately covered under Stipulation No. 2 Orientation Program, ITL No. 2 Information on Bird and Marine Mammal Protection, and ITL No. 14 Information on Planning for Protection of Polar Bears. See also responses to **WWF 018-010**, **WWF 018-011**, and **WWF 018-017**.

WWF 018-020

The commenter is incorrect in suggesting that the pipeline that leaked on the North Slope was operating under MMS regulations. The MMS regulatory authority for pipelines is limited to the OCS.

However, on September 6, 2006, the Pipeline and Hazardous Materials Safety Administration proposed to extend Federal pipeline safety regulations to rural onshore hazardous-liquid gathering lines and low-stress lines within a defined buffer of previously defined ''unusually sensitive areas.'' These are nonpopulated areas requiring extra protection because of the presence of sole-source drinking water resources, endangered species, or other ecological resources. This rule will bring the so-called "transit lines" on the North Slope under the Federal pipeline safety regulations. The Alaska Dept. of Environmental Conservation also modified their regulations in December 2006 to increase regulations on the North Slope pipelines.

There are multiple methods to respond to oil spills under ice. In solid-ice conditions, trenches can be cut into the ice surface that will allow oil to rise to the surface where it can then be collected using oil recovery skimmers or burned in situ. Oil will become encapsulated in the ice sheet as the ocean surface freezes and when a solid sheet of ice is present. In these instances, if the oil is in a large enough pool, holes can be drilled into the pool and the oil pumped out. Another response method for encapsulated oil is to track the oil throughout the winter using buoys and once the ice sheet begins to melt, the oil will surface through the brine channels at which time it may be collected using skimmers or may be burned in situ.

WWF 018-021

Section II.B.3.c(2) briefly explains how ITL clauses facilitate mitigation. The following paragraphs expand on that brief explanation.

The ITL's are part of the proposed and final Notice of Sale. They provide information to the lessee about MMS and other agencies' requirements, rules, and regulations that are in place, and they are effective in reducing potential adverse effects from the Proposed Action. All leases issued by the Federal Government require the lessee to comply with all Federal laws and regulations. Compliance with these laws and regulations is enforced by the Federal Agency with jurisdiction for the resource, for example NMFS and the FWS are the responsible agencies for enforcing the rules and requirements of the ESA and the MMPA. The ITL clauses contain measures that, if followed, help ensure compliance with the laws and regulation. If the impact occurs in violation of the law or regulation, the government may bring a range of enforcement actions against the operators. For example, ITL 2, Bird and Marine Mammal Protection, do not create new requirements, but they do provide awareness to the lessee of practices for avoiding harm to resources that the law and regulations are designed to protect.

The ITL clauses also contain "benchmarks" or "best practices" that operators may follow to comply with provisions of existing laws such as the MMPA, the ESA, and the OCS Lands Act and the implementing regulations of these laws. The ITL information also explicitly state the standards and objectives to which the actual activities proposed in an operator's exploration plan or development and production plan will be evaluated during the NEPA review of those plans. These benchmarks in the ITL clearly illuminate when practices proposed by the operator meet or do not meet the standard, indicating the need for additional mitigation measures, and MMS intent to require those measures. As such, the ITL, along with lease stipulations, are an appropriate mechanism at the lease sale stage where a general scenario is used to explore potential effects from typical activities.

WWF 018-022

The MMS agrees with the commenter's appraisal of this issue; all the points the commenter raises are valid. However, two points need to be clarified. The MMS is not "relying" on this measure as a mitigation measure, but merely suggests it as one way to reduce polar bear aggregations on the coast during the fall open-water period. Furthermore, MMS is not advocating removing all whale carcasses from the coast; we are identifying removal of whale carcasses as a potential action that could reduce the risk of an oil spill contacting polar bears. The MMS acknowledges in the draft EIS that this action is outside of MMS's purview, and states that "the whale remains are on Native-owned lands; thus, that decision will have to be negotiated with the Native communities themselves." The commenter is correct in pointing out that this is a complex issue and that many factors will have to be considered. The MMS will rely on the scientific expertise of the FWS, USGS, and the North Slope communities when considering this issue.

It is worth pointing out that whale carcasses outside of Native villages represents a huge attractant to bears during the fall open-water period. Any bears attracted to villages along the coast have an increased chance of coming into conflict with humans in and around the villages, and of being shot as "nuisance" bears. This is another issue to be considered in any future decisions related to polar bears and bone piles.

WWF 018-023

The EIS fully discusses the potential impact on polar bears from contact with oil under the Proposed Action analysis in Section IV.C.1.h(4)(e). The cumulative case scenario is presented in Section V.B. Our definition of "reasonably foreseeable" and the future Federal and State activities that are considered reasonably foreseeable for the cumulative analysis are presented in Section V.B. For the Chukchi Sea Sale 193 cumulative scenario, only exploration from future leasing in the Beaufort Sea is considered reasonably foreseeable. The oil-spill scenario for the cumulative case is presented in Section V.C. This section was inadvertently left out of the draft EIS and has been included in the final EIS. The cumulative oil-spill scenario includes spills from reasonably foreseeable activities (as defined in Sec. V.B.) from past, current, and future Federal and State actions. The analysis of cumulative impacts to polar bears does consider the effects of past, current, and reasonably foreseeable activities including the cumulative case oil spills.

WWF 018-024

The cumulative oil-spill scenario includes spills from reasonably foreseeable activities. Our definition of "reasonably foreseeable" and the future Federal and State activities that are considered reasonably foreseeable for the cumulative analysis are presented in Section V.B. The mean number of spills occurring is estimated based on the rates of spill occurrence and volumes of oil that may be produced and transported. The cumulative oil-spill scenario includes the oil assumed to be produced and transported as a result of the Proposed Action and the oil projected from production in Federal OCS and State waters in the Arctic as a result of past, current, and reasonably foreseeable Federal and State actions. As production from leases resulting from future lease sales is considered speculative and not reasonable foreseeable for our cumulative case scenario. Oil spills from future lease sales are not included in the cumulative oil-spill scenario. The analysis of cumulative impacts to polar bears does consider the effects of past, current, and reasonably foreseeable activities including the cumulative case oil spills. See also the response to comment **WWF 018-023**.

WWF 018-025

The cumulative effects analysis does include potential impact of past, present, and reasonably foreseeable future effects of oil and gas development in the coastal area. Section V.B.1 describes fields and infrastructure that are considered in the cumulative effects analysis. Section V.B.2 describes fields currently producing or in the stages of development. Section V.B.3 describes reasonably foreseeable future development and production projects. These effects are accounted for in the analysis of potential cumulative effects on the various resources in Sections V.C.1 through V.C.16.

WWF 018-026

We disagree that the EIS overlooks the "changes to the Arctic marine environment that have already adversely affected polar bear populations in Alaska." Conditions that are occurring or already have occurred are most appropriately described in Section III, Description of the Affected Environment. Section III.B.6.c, Marine Fissipeds—Polar Bears, clearly and extensively describes effects to bears from changes in the marine environment.

WWF 018-027

The mitigation measures are listed in Section IV.C.1.h(5), Benefits of Standard Mitigation. The text has been changed to refer the reader to these measures. The effectiveness of these and potential measures are described in Section IV.C.1(h)(6). Additional measures may be identified and implemented through the Exploration Plan and Development and Production Plan, should lessees apply to undertake these actions.

WWF 018-028

Water depth is identified in the bathymetry map of the lease sale area, see Figure III.A-1. Sea ice coverage varies from season to season and from year to year; however, Figure III.A-11 captures a generalized view of the maximum retreat of sea ice in recent years. Habitat used by Pacific walruses varies seasonally and from year to year and is dependent on the movements and extent of the sea ice, as well as other factors such as prey availability. Pacific walruses occur seasonally throughout much of the central lease-sale area (Jay and Garlich-Miller, pers. commun.) See Section III.B.6.a(5) for further discussion of Pacific walrus movements.

Oil-spill prevention and response are discussed in Section IV.A.5. Specific oil-spill response mitigation measures will be developed at the time that specific exploratory drilling and development activities are proposed. Areas acutely sensitive to disturbance, such as seasonal coastal haulouts, will be addressed at that time. The MMS is the regulatory agency charged with ensuring that provisions of the Oil Pollution Act of 1990 are complied with by the responsible party for OCS operations; MMS requirements can be

found in 30 CFR 254. Concerns regarding the Pacific walrus would be addressed by MMS in close consultation with FWS at that time.

The operator would be required to identify sensitive environments of concern such as the ice edge or haulouts that may be impacted by a spill from their operations and identify methods to protect those areas. Protection could involve deflection of the oil, placement of exclusion booms and/or hazing procedures to keep animals from entering a contaminated area. They would be responsible for ensuring their plans are consistent with the Alaska Federal and State Preparedness Plan for Response to Oil and Hazardous Substance Discharges and Releases and the appropriate Alaska Sub-area Contingency Plan. The MMS also may impose additional requirements to further protect sensitive environments if the proposed mitigation is insufficient.

WWF 018-029

Most seismic surveys will occur in areas of open water, where walrus densities are expected to be low. Although some Pacific walruses may be temporarily displaced by seismic cruises, those effects are expected to be insignificant. Furthermore, as far as is known, there have been no lethal takes of walruses associated with oil and gas activities in Alaska, including from seismic operations. If the commenter is aware of any information that documents lethal takes of walruses as a result of oil and gas activities, MMS would be very interested in including that information in future analysis.

Suspected declines in the Pacific walrus population are discussed in Section III.B.6.a(5). Cumulative effects of climate change on the Pacific walrus are discussed in Section V.C.8.b.

WWF 018-030

The altitude restrictions contained in the draft EIS were based on close consultations with FWS. The commenter is correct in pointing out that displacing walruses from forage areas ultimately could have population-level effects. However, MMS is unaware of any delineation of walrus habitat precise enough to allow an evaluation of important walrus feeding areas. Therefore, it is not possible to conclude that there will be significant impacts to Pacific walrus-foraging areas without more specific information on the location of those areas and the effects of disturbance at a population level. If the commenter knows of any research that precisely delineates important walrus-foraging areas in the Chukchi Sea and/or analyzes the effects of disturbance on the Pacific walrus, MMS would be very happy to consider that information in future analyses.

Determining a specific height at which Pacific walruses will not react to overflights is difficult. Aircraft occasionally cause extreme reactions; however, the variability of walrus response is large and unpredictable (Kruse, 1997). Pacific walruses react differently on icefloes than on terrestrial haulouts, and the level of disturbance depends on the type of aircraft, speed and direction of the aircraft, the number and age of walruses present, surrounding ambient noise from wind or wave action, and other factors. However, MMS, in consultation with FWS, has reevaluated this issue and determined that 1,500-ft AGL or ASL and 0.5 miles lateral distance is an adequate buffer in most cases when walrus are hauled out on ice (Efroymson and Suter, 2001). This mitigation measure also will ensure that the height restrictions for aircraft overflying walruses are consistent with those for cetaceans and marine birds, which will make it easier for pilots to comply with all flight restriction mitigation measures. Section II.B.3 will be updated accordingly.

The danger of trampling events is highest when walruses are hauled out in large herds on terrestrial sites. Calves are particularly vulnerable to trampling injuries in such cases (Kochnev, 2004). Walruses are most likely to stampede from flights that pass directly overhead and from repeated over flights (Kruse, 1997; Johnson et al., 1988). The 1,500-ft AGL and 0.5 miles lateral distance will apply to terrestrial haulouts and will minimize potential disturbances. In addition, pilots that harass or disturb marine mammals (defined under the MMPA as “the negligent or intentional operation of an aircraft or vessel, or the doing of any other negligent or intentional act which results in disturbing or molesting a marine mammal;”) are in direct

violation of the MMPA. The FWS may impose additional restrictions, through their Incidental Take authority under the MMPA, to protect seasonal haulouts that may form along the coast.