UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

AUG 2 0 2007

To All Interested Government Agencies, Public Groups:

Pursuant to the National Environmental Policy Act, an environmental review has been performed on the following action:

TITLE: 2007 Supplemental Environmental Assessment of the 2007 Open water Seismic Survey Season in the Chukchi and Beaufort Seas

LOCATION: Arctic Ocean.

SUMMARY: A Supplemental Environmental Assessment (S-EA) has been prepared that examines the environmental consequences of issuing an authorization, under section 101(a)(5)(D) of the Marine Mammal Protection Act, for the harassment of several species of marine mammals incidental to conducting marine seismic surveys in the Arctic Ocean during the summer and fall, 2007 and into the early summer 2008 open water seismic survey season. The principal means of taking by this activity is expected to be disturbance by seismic noise. The National Marine Fisheries Service (NOAA Fisheries Service) has determined that the single seismic survey action will have a negligible impact on the affected species or stocks of marine mammals and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses provided the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are implemented. The NOAA Fisheries Service has determined that the impact of conducting seismic surveys in this area will result in, at worst, a temporary modification in behavior by certain species of marine mammals, principally bowhead and gray whales, and ringed, bearded and spotted seals. While behavioral reactions and area avoidance by individuals may be made as a result of the onset and persistence of seismic noises, this behavioral change is expected to have a negligible impact on the affected species or stocks of marine mammals.

RESPONSIBLE OFFICIAL: William T. Hogarth, Ph.D.
Assistant Administrator
for Fisheries
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, Maryland 20910

The environmental review process has led NOAA Fisheries Service to conclude that issuance of three Incidental Harassment Authorizations for this activity will not have a significant effect on the

human environment. Therefore, an Environmental Impact Statement was not prepared for this action. A copy of the S-EA and Finding of No Significant Impact is enclosed for your information.

Sincerely,

Rodney F. Weiher, Ph.D.
NEPA Coordinator

Enclosure

Supplemental Environmental Assessment of the 2007-Early Summer 2008 Open-water Seismic Survey Season in the Chukchi and Beaufort Seas

I.A. PURPOSE OF AND NEED FOR THE PROPOSED ACTION

Sections 101(a)(5)(A) and (D) of the Marine Mammal Protection Act (MMPA; 16 U.S.C. 1361 et seq.) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

An authorization shall be granted if the National Marine Fisheries Service (NMFS) finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses and the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. NMFS has defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Section 101(a)(5)(D) of the MMPA established an expedited process by which citizens of the United States can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as:

> any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Section 101(a)(5)(D) establishes a 45-day time limit for NMFS review of a complete application followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of marine mammals. Within 45 days of the close of the comment period, NMFS must either issue or deny issuance of the authorization.

On November 22, 2006, NMFS received an application from Shell Offshore, Inc. (SOI) and WesternGeco for the taking, by incidental harassment, of several species of marine mammals incidental to conducting a marine seismic survey program during 2007 in the mid- and eastern-Beaufort and northern Chukchi seas. SOI's 2007 open water seismic program includes: (1) Chukchi Sea Deep 3D Seismic, (2) Beaufort Sea Deep 3D Seismic; and (3) Beaufort Sea Marine

Surveys (including site clearance and shallow hazards (sonar, shallow seismic, acoustic monitoring studies, seabed topography) and environmental monitoring)). The deep seismic survey component of the program will be conducted from WesternGeco's vessel the *M/V Gilavar*. The *M/V Gilavar* will tow two seismic arrays, comprising three identical subarrays each, which will be fired alternately as the ship sails downline in the survey area. The *M/V Gilavar* will tow up to 6 hydrophone streamer cables up to 3.4 miles long. Because the noise generated by the airguns has the potential to disrupt the behavior patterns of marine mammals in the vicinity of the survey vessel and have an impact on native subsistence hunting of marine mammals, an Incidental Harassment Authorization (IHA) under section 101(a)(5)(D) of the MMPA is warranted.

The seismic acquisition vessel will be supported by the *M/V Kilabuk*, or similar ice-class vessel. The *Kilabuk* will serve as a resupply, fueling support of acoustic and marine mammal monitoring, and seismic chase vessel. It also is capable of assisting in ice management operations but will not deploy seismic acquisition gear.

The *M/V Gilavar* entered the Chukchi Sea in mid-August and deployed its seismic acquisition equipment in anticipation of obtaining an IHA. SOI had wanted to start collecting seismic acquisition about July 20, 2007, but was delayed due to NMFS' inability to issue the IHA prior to August 19, 2007. Data acquisition will continue in the Chukchi Sea until SOI determines it has obtained the necessary quantity of data. SOI informed NMFS on August 17, 2007, that it intends to remain in the Chukchi Sea for approximately 6-8 weeks and then transit into the Beaufort Sea to conduct surveys for approximately 5-6 weeks, depending on ice conditions. For each 3-D seismic area, the *M/V Gilavar* will traverse the area multiple times until data on the area of interest has been recorded. At the conclusion of seismic acquisition in the Beaufort Sea, SOI intends to return to the Chukchi Sea to collect remaining data that was not collected earlier in the season. In addition, if SOI plans for the *M/V Gilavar* (or another seismic vessel) to return to the Chukchi Sea in 2008, seismic data acquisition can not begin earlier than July 15, 2008 in order to ensure that there will be no conflict with the spring bowhead whale migration and subsistence hunts conducted by Barrow, Pt. Hope, or Wainwright or the beluga subsistence hunt conducted by the village of Pt. Lay in July.

In addition to deep seismic surveys, SOI also plans to conduct site clearance and shallow hazard surveys of potential exploratory drilling locations within Shell's lease areas in the Beaufort Sea. The site clearance and shallow hazards surveys will be conducted by the *M/V Henry Christoffersen*, the same vessel used during Shell's 2006 site clearance and shallow hazard surveys. The site clearance surveys are confined to very small specific areas within defined Outer Continental Shelf (OCS) blocks. Very small and limited geophysical survey energy sources will be employed to measure bathymetry, topography, geological hazards and other seabed characteristics. In 2006, Shell used a 250 in^3 airgun array for this work. Field verification measurements showed that the sound pressure level (SPL) was 0.25 km at 180 dB, 1.75 km at 160 dB and 22.2 km at 120 dB. As a result of these SPLs, SOI decided to use a smaller array in 2007. For 2007, SOI is using a dual array, each with two-10-$inch^3$ airguns, totaling 40 $inch^3$.

Although a 40 inch^3 airgun array is usually below a level warranting an IHA, SOI's shallow hazards survey will be covered under the IHA and SOI will implement the same mitigation and monitoring measures required for the deep seismic array. This is principally due to the fact that SOI will be monitoring to the 120-dB isopleth in the Beaufort Sea to look for migrating bowhead cow/calf pairs.

In order to ensure that incidental takings by SOI's seismic activity are negligible and at the lowest level practicable, SOI has proposed implementing a marine mammal mitigation and monitoring program that will consist of monitoring and mitigation during SOI's seismic survey activities. Monitoring will provide information on the numbers of marine mammals potentially affected by these activities and permit real time mitigation to prevent injury of marine mammals by industrial sounds or activities. These goals will be accomplished by conducting vessel- , aerial-, and acoustic-monitoring programs to characterize the sounds produced by the seismic airgun arrays and related equipment and to document the potential reactions of marine mammals in the area to those sounds and activities. Acoustic modeling will be used to predict the sound levels produced by the seismic, shallow hazards and drilling equipment in the U.S. Beaufort and Chukchi seas. Acoustic measurements will also be made to establish zones of influence around the activities that will be monitored by observers. Aerial monitoring and reconnaissance of marine mammals and recordings of ambient sound levels, vocalizations of marine mammals, and received levels should they be detectable using bottom-founded acoustic recorders along the Beaufort Sea coast will be used to interpret the reactions of marine mammals exposed to the activities. The components of SOI's mitigation and monitoring programs are described in Chapter V.B.in this S-EA.

In addition to the MMPA, the OCS Lands Act, as amended, mandates the Secretary of the Interior through the Minerals Management Service (MMS), to manage the development of the outer continental shelf (OCS) oil, gas, and mineral resources while protecting the human, marine, and coastal environments (43 U.S.C. 1340).

Pursuant to the National Environmental Policy Act (NEPA), this S-EA has been prepared for the purposes of determining the potential impacts that may result from the proposed action, which is the issuance of an IHA to SOI for taking, by Level B (behavioral) harassment of marine mammals during the 2007 open water seismic survey season (mid-July to November 1, weather dependent) and through the early 2008 summer timeframe (through expiration of the IHA). Specifically, seismic surveys (e.g., two-dimensional [2D] and three-dimensional [3D] streamer surveys and high-resolution site-clearance surveys) would be conducted to produce data and information on oil and gas resources in support of possible exploration and development activities in the waters in the mid and eastern Beaufort and on pre-lease areas in the Northern Chukchi Sea (see Map 1 in MMS, 2006a). This S-EA was also prepared to support, as necessary, MMS' permitting process for geophysical seismic surveys.

In analyzing the potential impacts from seismic survey activities, NMFS and MMS have reviewed the analyses contained in several related documents, including: (1) the Final

Programmatic Environmental Assessment (Final PEA) on "Arctic Ocean Outer Continental Shelf Seismic Surveys-2006" (USDOI, MMS, 2006a); (2) the draft Programmatic Environmental Impact Statement (D-PEIS) on "Seismic Surveys in the Beaufort and Chukchi Seas, Alaska" (USDOI, MMS, 2007a); (3) the Final EIS on "Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea" (USDOI, MMS, 2007b); and (4) the NMFS' Biological Opinion on Arctic Region OCS (ARBO) activities dated June 16, 2006. Collectively, these documents provide the most recent information in assessing the impacts from seismic survey activities in the Beaufort and Chukchi Seas. As the Purpose and the Need for this S-EA falls within the scope of the activities and issues analyzed under these documents and no new information has become available since their publication to change these analyses, these documents are incorporated into this S-EA by reference.

The scope, objectives, and assumptions in this S-EA remain the same as those described in the 2006 Final PEA (Section I.C, pages PEA-4 and PEA-5, and Table I.C-1) and are incorporated by reference, except to the extent the analysis focuses on the potential impacts of one seismic operation as compared to up to four in the 2006 PEA. Further, NMFS has conducted an analysis of Shell's proposed activity, including the applicant's mitigation and monitoring program as described in their application, in order to determine whether the specified activity would result in no more than a negligible impact on small numbers of marine mammal species or stocks, or result in an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses.

NMFS Statutory and Regulatory Mandates. Under the MMPA, the taking of marine mammals without a permit or exemption from NMFS is prohibited. The term "take" under the MMPA means "to harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect." NMFS has further defined takes by "harassment" into two types: (1) Level A Harassment as "any act of pursuit, torment, or annoyance, which has the potential to injure a marine mammal or marine mammal stock in the wild" and (2) Level B Harassment as "any act of pursuit, torment, or annoyance, which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild." To date, NMFS' policy has been to use the 180-decibel (dB) root-mean-squared (rms) isopleth for cetaceans and 190-dB rms isopleth for pinnipeds to indicate where Level A harassment from acoustic sources begins. In addition, NMFS uses the 160-dB rms isopleth to indicate where Level B harassment begins for acoustic sources, including impulse sounds, such as used for seismic surveying.

In order to obtain an exemption from the MMPA's prohibition on taking marine mammals, a citizen of the United States who engages in a specified activity (other than commercial fishing) within a specified geographic region must obtain an incidental take authorization (ITA) under section 101(a)(5)(A) or (D) of the MMPA. An ITA shall be granted if NMFS finds that the taking of small numbers of marine mammals of a species or stock by such citizen will have a negligible impact on the affected species or stock(s) and will not have an unmitigable adverse impact on the

availability of the species or stock(s) for subsistence uses. NMFS may also prescribe, where applicable the permissible methods of taking and other means of effecting the least practicable impact on the species or stock and its habitat (i.e., mitigation, monitoring and reporting of such takings). ITAs may be issued as either (1) Letters of Authorization (LOAs) or (2) IHAs, the latter applicable when there is no potential for serious injury and/or mortality or where any such potential can be negated through required mitigation measures. Application instructions for marine mammal incidental take authorizations, whether an LOA or an IHA, can be found at: http://www.nmfs.noaa.gov/pr/permits/incidental.htm. ITA applications currently under public review (including Arctic activities) can also be found at this site.

As part of the MMPA authorization process, applicants are required to provide detailed mitigation plans that outline what efforts will be taken to reduce negative impacts to marine mammals, and their availability for subsistence use, to the lowest level practicable. In addition, MMPA authorizations require that operators conduct monitoring, which should be designed to result in an increased knowledge of the species and an understanding of the level and type of takings that result from the authorized activities. Under the MMPA, NMFS further requires that monitoring be designed to provide information and data verifying (or disputing) that the taking of marine mammals are, in fact, negligible and there are no unmitigable adverse impacts on the availability of marine mammals for subsistence uses.

In making a determination of no unmitigable adverse impacts to subsistence uses of marine mammals, NMFS and MMS assume that requirements for a Plan of Cooperation (POC) with the affected Alaskan Native communities will be met[1]. NMFS and MMS also assume that a Conflict Avoidance Agreement (CAA), or similar document, will be agreed to by the applicant and affected Alaska Native groups to lessen the potential for negative impacts to subsistence-harvest activities[2]. The 2007 CAA has been reviewed by NMFS and determined that compliance with the CAA ensures that there will not be an unmitigable adverse impact on subsistence uses of affected marine mammal species and stocks. The measures in the CAA and in the IHA include time and area closures in the Beaufort and Chukchi seas, similar to those imposed during the 2006 open water season or other management controls to limit or curtail operations based on results from site specific monitoring programs. For 2007 and the early part of the 2008 seismic season, these measures (either required by the 2007 CAA or the NMFS' IHA) include a prohibition on conducting seismic surveys during the spring bowhead and beluga migration/subsistence hunting period in the Chukchi Sea, during the bowhead whale hunting season in the Beaufort Sea, dispute resolution, and emergency assistance to whalers at sea.

MMS Statutory and Regulatory Mandates. Pursuant to 30 C.F.R. § 251.4, a Geological and Geophysical (G&G) permit must be obtained from MMS to conduct geological or geophysical

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[1]For 2007, SOI submitted a Plan of Cooperation (which has been periodically updated by SOI) to NMFS as part of its IHA application .

[2]A 2007 CAA has been signed by SOI and the Alaska Eskimo Whaling Commission.

exploration for oil, gas, and sulphur resources. The MMS authority is discussed in the 2006 PEA (section I.A.1.) which is incorporated by reference here.

NMFS and MMS Shared Mandates. Section 7 (16 U.S.C. § 1536) of the Endangered Species Act (ESA) states that all Federal agencies shall, in consultation with and with the assistance of the Secretary of the Interior/Commerce (Secretary), ensure that any actions 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 destruction or adverse modification of habitat of such species, which is determined by the Secretary to be critical. A summary of NMFS' and MMS' ESA consultations with the NMFS Office of Protected Resources, Endangered Species Division and the U.S. Fish and Wildlife Service (FWS) in regards to the Proposed Action is provided in Section VI of the 2006 Final PEA, which is incorporated by reference here.

Under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), Federal agencies are required to consult with the Secretary of Commerce with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency may adversely affect essential fish habitat (EFH) identified under the MSFCMA. A summary of NMFS' and MMS' EFH consultation with the NMFS Office of Habitat Conservation in regards to the Proposed Action is provided in Section VI of the 2006 Final PEA.

II. DESCRIPTION OF THE ALTERNATIVES

II.A. Range of Alternatives.

The alternatives considered for this action, including issuance of an IHA to SOI for the 2007 and early part of the 2008 open-water seismic season are listed below and were previously described and analyzed in the 2006 Final PEA, and are hereby incorporated by reference. However, several of the alternatives have been modified/supplemented to reflect input from the NEPA scoping process. For example, alternatives that include mitigation measures for "Temporal/ Spatial/Operational Restrictions" now reflect FWS requirements to monitor critical habitat for spectacled eiders.

Alternative 1. No Authorizations for Seismic-Survey Permits for Geophysical Exploration Activities (No Action). No seismic-surveys would be authorized by MMS and NMFS would not issue an IHA. The oil and gas industry would have to rely on other means to obtain needed geophysical information, such as using new data-processing technology to reanalyze existing geophysical exploration seismic data and/or using survey techniques other than seismic.

Alternative 2. Seismic Surveys for Geophysical-Exploration Activities would be Authorized with Existing Alaska OCS Geological and Geophysical Exploration Stipulations and Guidelines. Proposed surveys would be approved only with existing MMS stipulations related to G&G exploration activities on the OCS. For a complete description of the standard MMS G&G Permit Stipulations, see the 2006 PEA at section IV.A.

NMFS identifies this alternative as the alternative without measures that would provide protection for marine mammals and reduce impacts on marine mammals from seismic activities to the lowest level practicable. As such, this alternative does not meet the Purpose and Need because it does not contain sufficient measures that will achieve or result in the least practicable impact on marine mammal stocks or species located in the Beaufort/Chukchi Seas as required by the MMPA. Accordingly, this alternative will not be analyzed in any greater detail because it fails to meet the statutory requirements of the MMPA.

Alternatives 3-6: Additional Protective Measures

For Alternatives 3-6 below, additional protective measures for fish and wildlife resources would apply. These mitigation measures are described in more detail in Section V. later in this S-EA and in Section IV of the P-EA. These measures are based on: (1) the measures in the July 1999 and August 2001 IHA's from NMFS for marine geophysical permits in the Beaufort Sea OCS; (2) the NMFS-issued IHAs for the Beaufort and Chukchi OCS during the 2006 open water season; (3) the protective measures in MMS' most recent marine seismic-survey exploration permits; (4) Arctic Open Water meetings in 1999, 2001, 2006 and 2007; (5) the NMFS' Biological Opinion on Arctic Region OCS activities, dated June 16, 2006 (NMFS, 2006); and (6) Section 7 ESA coordination with the FWS, dated April 3, 2007.

Alternative 3. Seismic Surveys for Geophysical-Exploration Activities would be Authorized with Existing Alaska OCS Geological and Geophysical Exploration Stipulations and Guidelines and Additional Protective Measures for Marine Mammals, including a 120-dB Specified-Exclusion Zone.

Alternative 4. Seismic Surveys for Geophysical-Exploration Activities would be Authorized with Existing Alaska OCS Geological and Geophysical Exploration Stipulations and Guidelines and Additional Protective Measures for Marine Mammals, including a 160-dB Specified-Exclusion Zone. The intent is to help protect marine mammals (including bowhead whales) against potential Level B (behavior harassment) incidental takes and potential Level A (harassment - injury) incidental takes if the seismic operator has not received incidental take authorization from the NMFS and/or FWS. The mitigation measures identified under this alternative are sometimes proposed by and voluntarily undertaken by an applicant, with or without concurrence by NMFS, if they are using very small airguns or scientific equipment utilizing sound and can avoid Level B harassment takings. This alternative is for those activities with the following conditions: (1) observers can see to the 160 dB isopleth, (2) the airgun or airgun array is shutdown when marine mammals enter the 160 dB isopleth zone, and (3) operations are confined to daylight hours so observers are not disadvantaged by night-time conditions from seeing marine mammals within the 160 dB zone. (The 160-dB isopleth is where Malme et al. (1984, 1986) found migrating gray whales avoided seismic noise along the California coast, and it is used by NMFS to indicate where Level B harassment begins for impulse sounds, such as seismic). However, this alternative is not practical for SOI's activity since none of these conditions apply (they have a large seismic array operating 24 hours/day and the 160-dB isopleth is approximately 7.9 km, which cannot be seen by the vessel marine mammal observers). As a result, this alternative will not be analyzed in any greater detail in this S-EA.

Alternative 5. Seismic Surveys for Geophysical-Exploration Activities would be Authorized with Existing Alaska OCS Geological and Geophysical Exploration Stipulations and Guidelines and Additional Protective Measures for Marine Mammals, including 160-dB and 120-dB Specified-Exclusion Zones. This alternative would provide special protection for: (1) bowhead whale calves; (2) reproductive-aged female bowhead whales; (3) aggregations of whales; and (4) fall subsistence hunting of bowhead whales in the Beaufort Sea. The NMFS would determine if and when to expand the exclusion-zone isopleth from 160 dB to 120 dB, thereby increasing the size of the exclusion zone. The criteria used by NMFS for making this decision would be based on the presence of cow/calf pairs, aggregations of bowhead whales, and the timing and location of the subsistence hunt in both the Beaufort and Chukchi seas. Moreover, a number of these measures are included in the specified activity as proposed by SOI for its 2007 seismic surveys.

Alternative 6. Seismic Surveys for Geophysical-Exploration Activities would be Authorized with Existing Alaska OCS Geological and Geophysical Exploration Stipulations and Guidelines and Additional Protective Measures for Marine Mammals, Including a 180/190 dB Specified-Exclusion Zone. This alternative establishes exclusion zone isopleths of 180 dB (Level A

harassment-injury) for cetaceans and the Pacific walrus and 190 dB (Level A harassment-injury for pinnipeds other than the Pacific walrus). These levels are used by NMFS to indicate where Level A harassment (injury) potentially begins.

II.B. Evaluation of Alternatives.

II.B.1. Alternatives Excluded from Further Evaluation.

For reasons indicated in Section II.A. of this S-EA, Alternatives 1, 2, and 4 are not analyzed in greater detail in this document because they do not meet the Purpose and Need of the Proposed Action (i.e., issuance of an IHA to SOI for the 2007open-water seismic season) as they do not contain sufficient measures that will achieve or result in the least practicable impact on marine mammal stocks or species located in the Beaufort/Chukchi Seas as required by the MMPA.

II.B.2. Alternatives Considered in More Detail

Alternative 3,5, and 6 are considered in more detail in this S-EA because each, to varying degrees, is effective, efficient, and feasible, at least at certain times and locations. An evaluation of effectiveness, efficiency and feasibility of these alternatives is analyzed in Chapter II.B.2a, 2b and 2c, respectively.

Collectively, the aforementioned NEPA and ESA documents provide the most recent information describing the existing environment and assessing the potential impacts from seismic surveying activities in the Beaufort and Chukchi seas. The Purpose and Need for the Proposed Action for this S-EA falls within the scope of the activities and issues analyzed under these documents and with the described below exceptions to the aforementioned NEPA documents' cumulative scenario, no new information has become available since their publication to change the conclusions of these analyses. Accordingly, with the exception of the information analyzed in III.A. and III.B. of this chapter, the information contained in Chapter III of the PEA is incorporated herein by reference.

NMFS notes that the previously analyzed action was for 4 seismic operations in the Chukchi Sea and 4 seismic operations in the Beaufort Sea being conducted at the same time. Because NMFS has received only a single IHA application, it is evaluating herein the seismic operations for a single company (SOI) operating two seismic vessels (one deep seismic survey vessel operation in the Chukchi Sea and Beaufort seas and a single shallow-hazards seismic vessel in the Beaufort Sea). Therefore, this S-EA subsumes the information on the existing environment, alternatives, impact analyses and conclusions contained within the aforementioned documents.

Recent ESA discussions within NMFS indicate that the findings made in the 2006 ARBO on MMS' issuance of seismic survey permits and the issuance of the associated IHAs for seismic surveys are not likely to jeopardize the continued existence of threatened or endangered species (specifically the bowhead whale) under the jurisdiction of NMFS or destroy or adversely modify any designated critical habitat are still relevant to the 2007 open water seismic survey season. After reviewing the proposed 2007 open water, seismic survey activities and considering mitigation measures, the FWS concluded (in a letter to MMS dated April 3, 2007) that the seismic survey work in the Chukchi and Beaufort seas will not adversely affect Steller's or spectacled eiders or Kittlitz's murrelets and further consultation under the ESA is not required .

III.A. Analysis of SOI's 2007 Proposed Seismic Operations in the Chukchi and Beaufort Seas.

III.A.1. Description of SOI's Proposed 2007 Seismic Survey Activity

Deep seismic surveys, shallow hazard and site clearance surveys, and exploration drilling are scheduled to be conducted in the Beaufort Sea OCS in 2007 by SOI. SOI also plans to conduct deep seismic surveys in the Chukchi Sea OCS from mid-August until they start work in the Beaufort Sea and then again later in the fall when SOI leaves the Beaufort. No other oil and gas company is expected to conduct any offshore deep seismic surveys, shallow hazard and site clearance surveys, and exploration drilling in the U.S. Arctic Ocean OCS during the 2007 open water season. NMFS' IHA will also cover any activities that SOI undertakes in the early part of the 2008 seismic season (e.g., mid-July-early August 2008, or until SOI obtains a new IHA, whichever is earlier.

More information on SOI's G&G permit applications to MMS for deep seismic surveying can be viewed at: http://www.mms.gov/alaska/re/recentgg/RECENTGG.HTM and for SOI's plans for exploratory drilling at: http://www.mms.gov/alaska/ref/PublicInfo/Shell_BF/BF.HTM. The SOI applications to NMFS for authorization under the MMPA for both seismic and exploratory drilling activities and SOI's plan for monitoring marine mammals during the 2007 open water season can be found at: http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications. In addition, the Federal Register Notice for the proposed NMFS IHA for SOI's planned seismic activities published on June 7, 2007 (see 72 FR 31553).

SOI proposes to conduct seismic surveys (3D streamer surveys and high-resolution site-clearance surveys to produce data and information on oil and gas resources in support of possible exploration and development activities in the waters in the mid and eastern Beaufort Sea and on pre-lease areas in the Northern Chukchi Sea.

The *M/V Gilavar* entered the Chukchi Sea in mid-August and deployed its seismic acquisition equipment in anticipation of obtaining an IHA. SOI had wanted to start collecting seismic acquisition about July 20, 2007, but was delayed due to NMFS' inability to issue the IHA prior to August 19, 2007. Data acquisition will continue in the Chukchi Sea until SOI determines it has obtained the necessary quantity of data. SOI informed NMFS on August 17, 2007, that it intends to remain in the Chukchi Sea for the next 6-8 weeks and then transit into the Beaufort Sea to conduct surveys for approximately 5-6 weeks, depending on ice conditions. For each 3-D seismic area, the *M/V Gilavar* will traverse the area multiple times until data on the area of interest has been recorded. At the conclusion of seismic acquisition in the Beaufort Sea, SOI intends to return to the Chukchi Sea to collect remaining data that was not collected earlier in the season. Deep seismic surveys are expected to occur in the Chukchi Sea Sale 193 area and in the proposed 2002-2007 Chukchi Sea Program Area (USDOI, MMS, 2007b).

SOI's Beaufort Sea deep seismic survey program will take place in OCS waters on SOI's leases beginning east of the Colville River delta to east of the village of Kaktovik. The timing of activities is scheduled to avoid any conflict with the Beaufort Sea bowhead whale subsistence hunt conducted by the Alaska Eskimo Whaling Commission's villages.

SOI also proposes to conduct site clearance and shallow hazards surveys on SOI leased areas in the Beaufort Sea OCS (mainly the Sivulliq lease block north of Pt. Thomson east to the Olympia block north of Barter Island (see Figure 2 in SOI's IHA application). This is to help determine the potential for exploratory drilling locations within SOI's OCS lease areas and a potential pipeline corridor within and outside of SOI OCS lease blocks as required by MMS regulations. Additional site clearance studies are planned over a corridor from the center of the Sivulliq lease block south to Pt. Thomson, a distance of approximately 22.4 km (14 mi). Site clearance surveys in the Beaufort Sea will be conducted concurrently with SOI's 3D deep seismic survey program. The site clearance and shallow hazards surveys will be conducted by the *M/V Henry Christoffersen*, the same vessel used during SOI's 2006 site clearance and shallow hazard surveys).

In order to ensure that incidental takings by SOI's seismic activity are negligible and at the lowest level practicable, SOI has proposed implementing a marine mammal mitigation and monitoring program that will consist of monitoring and mitigation during SOI's seismic survey activities. Monitoring will provide information on the numbers of marine mammals potentially affected by these activities and permit real time mitigation to prevent injury of marine mammals by industrial sounds or activities. These goals will be accomplished by conducting vessel- , aerial-, and acoustic-monitoring programs to characterize the sounds produced by the seismic airgun arrays and related equipment and to document the potential reactions of marine mammals in the area to those sounds and activities. Acoustic modeling will be used to predict the sound levels produced by the seismic, shallow hazards and drilling equipment in the U.S. Beaufort and Chukchi seas. Acoustic measurements will also be made to establish zones of influence around the activities that will be monitored by observers. Aerial monitoring and reconnaissance of marine mammals and recordings of ambient sound levels, vocalizations of marine mammals, and received levels should they be detectable using bottom-founded acoustic recorders along the Beaufort Sea coast will be used to interpret the reactions of marine mammals exposed to the activities. The components of SOI's mitigation and monitoring programs are described in Section V.B. of this S-EA.

The dates indicated here represent what might occur under ideal conditions for performing marine seismic work whereas the actual dates will depend on sea ice and weather conditions as they occur in summer and mid-autumn of 2007.

III.A.2. Analysis of SOI's Proposed Seismic Survey Activity

Available information indicates that marine mammals are responsive, in some cases highly responsive, to anthropogenic noise in their environment. At present, the primary documented response has been avoidance, sometimes, at least in the case of bowhead whales at a considerable distance. Additional responses may include: tolerance (that is the capacity of the individuals to endure or become less responsive to the repeated exposure), masking of natural sounds, behavioral disturbance, auditory impacts (e.g., temporary and permanent threshold shifts), and other physiological effects. In addition, seismic surveys, either alone or in combination with other factors, can also have subtle, chronic effects such as: excluding marine mammals from important habitats (e.g., feeding and resting) at significant times, interfering with their migrations and movements, contributing to habitat degradation, disrupting biologically significant behaviors, and increasing levels of stress. Responses to noise and disturbance are also likely to vary with time of year; sex and reproductive status of individuals exposed; site (because of differences in noise propagation and use by bowheads); activity levels and the exact characteristics of that activity (e.g., airgun source levels, array configuration and placement in the water column; context (e.g., feeding versus migrating whales); the animal's motivation to be in an area; and options for alternative routes, places to feed.

In assessing the potential level of effects in this S-EA, it is helpful to compare this S-EA with the 2006 PEA. Important points of comparison between the two proposed actions include:

(A) The characteristics of the seismic sound sources are the same. The 2006 PEA considered airgun arrays measuring between 1,800-4,000 in^3 (and up to 6,000 in^3) and the use of marine streamer, ocean-bottom cable and high resolution seismic survey technology. This S-EA considers one vessel operating marine streamer surveys with an array gun arrays measuring 3,147 in^3 and one additional vessel operating high resolution surveys using a one airgun array (240 in^3) and subbottom profiler.

(B) The action area and timeframes for seismic operations considered in this S-EA are within the scope of those analyzed in the 2006 PEA.

(C) The species of marine mammals potentially affected by this S-EA's proposed action, including their potential age/sex composition, reproductive states, behavior (e.g., migration, feeding), etc., are the same as those identified in the 2006 PEA.

The main difference then between the proposed actions and analyses in the 2006 PEA and this 2007 S-EA, as it relates to potential impacts to marine mammals, is the amount of seismic sound source vessels operating in the action area and amount of seismic energy released into the environment. The 2006 PEA analyzed the potential impacts from a total of eight seismic survey sound-source vessels in Arctic waters (four in the Chukchi Sea and four in the Beaufort Sea). The 2007 S-EA provides for a limit of two seismic sound-source vessels (one operating for deep seismic in the Chukchi and Beaufort and one operating for high-resolution surveys in the Beaufort only). This is essentially a 75 percent reduction in the amount of sound source vessels. In addition, the 2006 PEA allowed for all eight seismic sound source vessels to all use larger airgun arrays. The proposed action under this 2007 S-EA includes one larger sound source vessel for 2D/3D surveys and one smaller sound source vessel for high resolution (i.e., site clearance) surveys. Also, fewer vessels in 2007 means seismic survey sounds will cover a smaller geographic area than analyzed in 2006.

Overall, these reductions qualitatively result in a greatly reduced amount of seismic energy output into the action area for 2007 than when compared to what was analyzed in the 2006 PEA. As all other factors that may influence the potential range of effects on marine mammals remain the same (e.g., types of status of marine mammals exposed, potential geographic area where surveys may occur), it is therefore appropriate to conclude that the proposed action under the 2007 SEA will result in substantially fewer impacts to marine mammals than what was analyzed under the 2006 PEA-- for which a Finding of No Significant Impact was reached. NMFS believes that potential adverse effects can be reduced through careful shaping of the action through the implementation of sufficient, practicable monitoring coupled with adaptive management (where the mitigation measures required are dependent on what is discovered during monitoring). These mitigation and monitoring measures are analyzed in Section IV of this S-EA.

III.B. Additional Cumulative Scenario Information and Assessment

SOI's 2007 exploration plan (EP) summarizes their proposed operations as a Beaufort Sea open-water exploration drilling and testing program for 2007, 2008, and 2009. SOI's EP was also environmentally assessed by the MMS and MMS signed a Finding of No Significant Impact (FONSI) on February 15, 2007.

SOI is proposing to drill up to four OCS exploratory wells at the Sivulliq prospect using two floating drilling units operating simultaneously. Drilling operations will be supported by two ice breakers. Additional support vessels will be staged between the drilling units to provide near immediate on-site oil spill response capability in the unlikely event of a spill. SOI also proposes to drill an undetermined number of wells on additional prospects in 2008/09, depending on the 2007 drilling results. If time and weather conditions allow, SOI will construct well cellars (holes dug or drilled in to the sea floor to depths of approximately 30-40 feet (ft) deep) during the 2007 open water season. The MMS requires that blowout preventors be installed in well cellars so that the top of the preventor is located below possible ice gouge depth. Well cellars can take 7-10 days to complete. Pre-construction of the well cellars in 2007 would provide a longer drilling window in 2008.

Although SOI expected to begin their exploratory drilling around mid-July and finish by November 1, a Stay has been issued by the 9th Circuit Court of Appeals which has delayed SOI's exploration/drilling program. In addition, on July 24th, SOI signed a CAA with the Alaska Eskimo Whaling Commission (AEWC) and some of the Whaling Captains Associations. One part of the CAA, prohibits drilling and seismic survey operations between August 25th and the end of the bowhead whaling season by the Village of Nuiqsuk (seismic and drilling), Kaktovik (seismic only) and Barrow (seismic only).

SOI's EP explains that operations would be conducted in a manner that is consistent with the lease terms, including two special stipulations: No. 4 Industry Site-Specific Bowhead Whales-Monitoring Program, and No. 5 Conflict Avoidance Mechanisms to Protect Subsistence Whaling and other Subsistence Activities.

In 2006, the State of Alaska, Division of Oil and Gas conducted two lease sales in state waters of the Beaufort Sea. The Beaufort Sea Area-wide 2006 sale, conducted on March 1, 2006, sold 62 tracts totaling approximately 204 million acres. The Beaufort Sea Area-wide 2006A sale, conducted on October 25, 2006, sold 13 tracts totaling approximately 33 million acres. No State of Alaska lease sales are scheduled to occur in the Chukchi Sea, nor are any State deep seismic survey permits scheduled to be issued for the Beaufort or Chukchi seas. However, the State has issued two 2007 permits for conducting geophysical technical surveys in State waters near Point Thompson. State mitigation measures and lessee advisories for the Beaufort Sea can be found at: http://www.dog.dnr.state.ak.us/oil/products/publications/beaufortsea/bsaw2006/bs_2006mits.pdf.

NMFS considers the potential 2007 level of seismic survey and other oil and gas-related

activities in the Chukchi Sea (i.e. one 3D deep seismic survey using streamers, 0 exploration activities, and 0 site clearance and shallow hazard surveys) to be substantially less than what was cumulatively analyzed in the 2006 PEA (i.e. 4 simultaneously-operating 2D/3D seismic surveys using streamers). This is further supported by a comprehensive analysis of the total 2006 Arctic activities, including the operation by 3 seismic activities (Shell, ConocoPhillips (CPAI) and GXTechnology). While the results are still being analyzed by NMFS, the AEWC, the North Slope Borough scientists and others, there does not appear to have been any significant adverse impacts by the 3 seismic vessels operating in 2006. For the most part, seismic survey operations were separated in both space (divided between the Canadian and U.S. Beaufort Seas and different areas of the Chukchi Sea) and time (Chukchi Sea: Shell July 29-September 19, CPAI July 29-Oct. 12 and GXT Oct. 16-Nov. 11). Therefore, no adverse cumulative impacts are expected to occur in the Chukchi Sea during the 2007 open water season. For this reason, and because of safety concerns associated with aerial surveys, NMFS does not believe that it is necessary to require a 120-dB safety zone after September 25, 2007.

The 2007 cumulative seismic survey scenario in the Beaufort Sea is similar to what was analyzed in the 2006 PEA (see section III.C in the 2006 Final PEA). In the 2006 PEA, 4 simultaneously-operating seismic survey operations (which could be either a combination of 2D/3D seismic surveys using streamers, ocean-bottom cable 2D/3D seismic surveys, or high-resolution surveys) and other associated noise-generating activities were analyzed (see section III.H in the 2006 Final PEA). In 2007, as mentioned in III.A. in this S-EA, 1 3D deep seismic survey and 1 high-resolution survey (i.e. site clearance and shallow hazard survey) will be conducted by SOI. The State of Alaska is also permitting 2 high-resolution surveys to work state waters near Pt. Thompson. In 2007, SOI is also planning to conduct exploratory drilling operations on selected lease blocks in the Beaufort Sea. The mitigation plan for SOI's exploratory operations took into consideration concurrent seismic survey operations in proximity to their exploratory operations. As each of the 3 hi-res surveys in 2007 will impact only small areas within about 1-2 km radius of the activity, and as only a single deep seismic survey vessel will be operating along with two drilling ships on SOI's Sivulliq site (if they operate at all in 2007), it is unlikely to result in a cumulative impact this year. In addition, the mitigation measures identified in the 2006 PEA, in concert with MMS's mitigation measures for SOI's exploration operation, are expected to reduce any potentially significant adverse effects to marine mammals.

IV. SUMMARY of FINDINGS AND MITIGATION MEASURES.

The 2006 Final PEA, 2007 Final EIS for the Chukchi Sea Lease Sale 193, 2006 NMFS ARBO, and the 2007 Draft EIS for Seismic Surveys in the Chukchi and Beaufort seas, all incorporated into this 2007 PEA by reference, document that the Beaufort and Chukchi seas support a wide variety of fish and wildlife resources. Many of these resources also support the Inupiat community's subsistence-harvest culture and lifestyle. The conclusion generated by the collective analysis of open water seismic surveys indicates that operating high-energy acoustic equipment, i.e., airguns, in the marine environment has the potential to cause adverse environmental impacts on the biological resources inhabiting the Beaufort and Chukchi seas. For example, marine mammals could be harassed and possibly harmed by the acoustic environment generated around the airgun source. Any potential adverse effects on marine mammals also might adversely impact subsistence communities that depend on marine mammals. Marine birds, although not thought to be directly injured by the sounds of an airgun or by repeated vessel and aircraft movements, potentially could be harassed, thereby causing them to flee resting and feeding areas and. Fishery resources might also be harassed or blocked from desired spawning and feeding habitat under certain circumstances, and shellfish potentially could be harmed directly by the high-energy sound source.

In regard to the cumulative impacts analysis in this S-EA, NMFS notes that the MMS prepared an EA on SOI's exploration activities in the Beaufort Sea, which included a cumulative analysis of the 2007 S-EA's proposed action. That NEPA analysis developed a mitigation plan and resulted in a FONSI by MMS. An approval letter, dated February 15, 2007, was sent to SOI regarding their EP activities, which included a list of stipulations. The subject letter can be found at: http://www.mms.gov/alaska/ref/PublicInfo/Shell_BF/BF.HTM. A major factor in MMS' finding is that an IHA from NMFS and a LOA from FWS is required before drilling operations commence. Therefore, if NMFS issues an IHA for SOI's exploration (drilling) activity, there will have been a determination that there will be negligible impacts to small numbers of bowhead whales and other marine mammals and no unmitigable adverse impact to the availability of subsistence uses of marine mammal resources. SOI is also required to implement a marine mammal monitoring program for their drilling operations and has agreed to shut down drilling operations in conformance with a signed CAA during the bowhead whale subsistence hunt.

The NMFS believes that by incorporating the mitigation measures identified in Chapter IV.A.2 in the 2006 Final PEA (also described in Chapter V.B of this S-EA) and which are incorporated by reference into this part of the S-EA, into the oil and gas industry's seismic survey plans-of-action, G&G permits applications, and IHA applications, they will eliminate the potential to cause significant adverse impacts on the fish, wildlife, and subsistence resources of the Beaufort and Chukchi seas. In addition, a prerequisite mitigation measure of obtaining an ITA or LOA from NMFS and/or FWS will assure that no unmitigatable adverse impact to subsistence uses of marine mammals will occur.

V. SELECTED ALTERNATIVE AND MITIGATION MEASURES

V.A Identification and Description of the Selected Alternative.

The impact assessment of the Proposed Action from the 2006 Final PEA (up to four seismic surveys simultaneously operating in both the Chukchi and Beaufort seas plus high-resolution work) resulted in NMFS and MMS issuing FONSIs for their respective actions. This was based on the level of activity, the analysis of potential impacts, and the selected alternative and its associated mitigation and monitoring requirements. There is no significant new information, beyond updates to the cumulative analysis, to suggest that there would be any change in the analysis from the 2006 Final PEA. No adverse cumulative impacts are expected to occur during the 2007 open water season because of the reduced level of activity and the mitigation measures proposed in existing MMS G&G permit applications and NMFS and FWS IHA/LOA authorizations. It is then reasonable to assume that there would be no potential for significant impacts to occur if the 2006 Final PEA selected alternative and mitigation measures were applied to the 2007 open water season. Therefore, NMFS has chosen to implement the 2006 Final PEA Selected Alternative 6 (Seismic Surveys for Geophysical- Exploration Activities would be Authorized with Existing Alaska OCS Geological and Geophysical Exploration Stipulations and Guidelines and Additional Protective Measures for Marine Mammals, Including a 180/190 dB Specified-Exclusion Zone) and will impose applicable mitigation measures, as proposed by Shell, for the 2007 S-EA open water season. This decision is based on:

- review of the analyses contained in the following documents: 2006 Final PEA, 2007 Final EIS for the Chukchi Sea Lease Sale 193, 2007 Draft EIS for Seismic Surveys in the Beaufort and Chukchi Seas, and the 2006 NMFS ARBO;
- review of the comments received from the public and agencies during the 30-day public comment period on SOI's application for an IHA (72 FR 31553, June 7, 2007).
- review of the comments received from the public and agencies during the NEPA scoping period for these documents
- review of the Purpose of and the Need for the Proposed Action under this S-EA; concurrence by NMFS that this alternative and associated mitigation would not change the analysis in their ESA section 7 consultation and ARBO issued in June 2006; and
- the ability of Alternative 6 and its associated mitigation and monitoring measures to fulfill both MMS' and NMFS' statutory mission and responsibilities and also meet the stated purpose of and the need for the proposed action.

V.B. Description of Mitigation and Monitoring Measures

Mitigation and monitoring measures have been proposed by Shell for its 2007 seismic activities. Additional measures will be required to ensure that the proposed activity will result in the least practicable adverse impact on marine mammals species or stocks in the Beaufort and Chukchi Seas. These mitigation and monitoring measures will appear as stipulations and/or guidelines in any seismic survey permits or authorizations granted by NMFS and MMS. These mitigation and

monitoring requirements contained in the MMPA IHA will ensure that takings are of small numbers, potential impacts to marine mammals will be negligible, and there will be no unmitigable impacts to subsistence uses. The MMPA additionally requires that any takings are below the level where injury might occur, the anticipated numbers of marine mammals that might be harassed are all relative to the affected species or stocks sizes, the cumulative effect of individual takings will not rise to population level impacts, and adverse impacts on subsistence-harvest activities will be avoided. All mitigation and monitoring measures, especially those related to avoiding impacts to subsistence hunting under the MMPA authorizations, will be followed or the NMFS and MMS permit/authorizations will be suspended until such time that the protective measures can be successfully performed and demonstrated. The following sections describe the environmental protection measures associated with the selected alternative:

V.B.1. NMFS- and FWS-specific requirements within their MMPA and ESA authorities

Exclusion Zone - A marine mammal exclusion zone of 180 dB (cetaceans) and 190 dB (pinnipeds) from the seismic-survey sound source shall be free of marine mammals before the survey can begin and must remain free of marine mammals during the survey. The purpose of the exclusion zone is to protect marine mammals from potential for Level A harassment (injury).

Monitoring of the Exclusion Zone - Individuals (marine mammal biologists or trained observers) shall monitor the area around the survey for the presence of marine mammals to maintain a marine mammal-free exclusion zone and monitor for avoidance or take behaviors. Visual observers monitor the exclusion zone to ensure that marine mammals do not enter the exclusion zone for at least 30 minutes prior to ramp up, during the conduct of the survey, or before resuming seismic-survey work after shut down. The NMFS will set specific requirements for the monitoring programs and observers.

Shut Down - The survey shall be suspended until the exclusion zone is free of marine mammals. All observers shall have the authority to, and will, instruct the vessel operators to immediately stop or de-energize the airgun array whenever a marine mammal is seen within the exclusion zone. If the airgun array is completely powered down for any reason during nighttime or poor sighting conditions, it shall not be re-energized until daylight or whenever sighting conditions allow for the exclusion zone to be effectively monitored from the source vessel and/or through other passive acoustic, aerial, or vessel-based monitoring.

Ramp Up - Ramp up is the gradual introduction of sound to deter marine mammals from potentially damaging sound intensities and from approaching the exclusion zone. This technique involves the gradual increase (usually 5-6 dB per 5-minute increment) in emitted sound levels, beginning with firing a single airgun and gradually adding airguns over a period of at least 20-40 minutes, until the desired operating level of the full array is obtained. Ramp-up procedures may begin after observers ensure the absence of marine mammals for at least 30 minutes. Ramp-up procedures shall not be initiated at night or when monitoring the exclusion zone is not possible.

A single airgun operating at a minimum source level can be maintained for routine activities, such as making a turn between line transects, for maintenance needs or during periods of impaired visibility (e.g., darkness, fog, high sea states), and does not require a 30-minute clearance of the exclusion zone before the airgun array is again ramped up to full output.

Field Verification - Before conducting the survey, the operator shall verify the radii of the exclusion zones within real-time conditions in the field. This provides for more accurate exclusion-zone radii rather than relying on modeling techniques before entering the field. Field-verification techniques must be consistent with NMFS-approved guidelines and procedures. When moving a seismic-survey operation into a new area, the operator shall verify the new radii of the exclusion zones by applying a sound-propagation series.

Monitoring of the Seismic-Survey Area - Aerial-monitoring surveys or an equivalent monitoring program acceptable to the NMFS may be required.

Temporal/Spatial/Operational Restrictions - Dynamic management approaches to avoid or minimize exposure, such as temporal or spatial limitations are based on marine mammals being present in a particular place or time, or being engaged in a particularly sensitive behavior (such as feeding).

(1) No seismic survey activity, including re-supply vessels and other related traffic, will be permitted within the Ledyard Bay spectacled eider critical habitat area following July 1 of each year, unless human health or safety dictates otherwise. Incursions for human health or safety purposes shall be reported within 24 hours to MMS. Other incursions will be considered noncompliance with this condition.

(2) Seismic survey support aircraft must avoid over flights across the Ledyard Bay spectacled eider critical habitat area below an altitude of 1,500 feet (450 m) after July 1 of each year, unless human health or safety dictates otherwise. Incursions for human health or safety purposes shall be reported within 24 hours to MMS. Other incursions will be considered noncompliance with this condition. In other coastal areas, seismic-survey support aircraft would maintain at least a 1,500 ft (305 m) altitude over beaches, lagoons, and nearshore waters as much as possible.

(3) Seismic vessel transits must not occur prior to July 1, 2008 in the spring leads ensure that there will be no conflict with the spring bowhead whale migration and subsistence hunts conducted by Barrow, Pt. Hope, or Wainwright or the beluga subsistence hunt conducted by the village of Pt. Lay in July.

(4) Seismic surveys must not occur prior to July 15, 2008 in the Chukchi Sea spring lead system, unless authorized by NMFS, to provide bowhead cow/calf pairs additional protection.

Reporting Requirements - Reporting requirements, such as the monitoring plans required by

FWS for polar bears and walruses prior to the start of seismic activities, provide the regulating agencies with specific information on the monitoring techniques to be implemented and how any observed impacts to marine mammals will be recorded. In addition, operators must report immediately any shut downs due to a marine mammal entering the exclusion zones and provide the regulating agencies with information on the frequency of occurrence and the types and behaviors of marine mammals (if possible to ascertain) entering the exclusion zones.

V.B.2. Additional Mitigation Measures

The following mitigation measures have the potential to further reduce adverse environmental impacts.

(1) As proposed by SOI, a 120-dB monitoring (safety) zone for bowhead whales in the Beaufort Sea will be established and monitored, once four or more bowhead whale cow/calf pairs are observed at the surface during an aerial monitoring program within the area to be seismically surveyed during the next 24 hours. No seismic surveying shall occur within the 120-dB safety zone around the area where the whales were observed, until two consecutive surveys (aerial or vessel) indicate they are no longer present within the 120-dB safety zone of seismic-surveying operations.

(2) A 160-dB vessel monitoring zone for bowhead and gray whales will be established and monitored in the Chukchi and Beaufort seas during all seismic surveys. Whenever an aggregation of bowhead whales or gray whales (12 or more whales of any age/sex class that appear to be engaged in a nonmigratory, significant biological behavior [e.g., feeding, socializing]) are observed during an aerial or vessel monitoring program within the 160-dB safety zone around the seismic activity the seismic operation will not commence or will shut down immediately, until two consecutive surveys (aerial or vessel) indicate they are no longer present within the 160-dB safety zone of seismic-surveying operations.

(4) Aerial and vessel surveys will be conducted in the Beaufort and Chukchi (vessel only) seas during the fall bowhead whale-migration period to detect bowhead whale cow/calf pairs and to detect aggregations of feeding bowhead and gray whales. The protocols for these aerial and vessel monitoring programs have been specified in the MMPA authorizations granted by NMFS.

(5) Survey information, especially information about bowhead whale cow/calf pairs or feeding bowhead or gray whales, shall be provided to NMFS as required in MMPA authorizations, and will form the basis for NMFS determining whether additional mitigation measures, if any, will be required over a given time period.

(6) Seismic-survey and associated support vessels shall observe a 0.5-mile (~800-meter) safety radius around Pacific walrus groups hauled out onto land or ice.

(7) Aircraft shall be required to maintain a 1,000-foot minimum altitude within 0.5 miles

of hauled-out Pacific walruses.

(8) SOI shall notify MMS, NMFS, and FWS in the event of any loss of cable, streamer, or other equipment that could pose a danger to marine mammals.

(9) To avoid significant additive and synergistic effects from seismic-survey operations that occur simultaneously with other oil and gas industry activities (i.e., drilling) which might hinder the migration of bowhead whales, NMFS and MMS may require special restrictions, such as additional temporal or spatial separations.

(10) Seismic cables and airgun arrays must not be towed in the vicinity of fragile biocenoses, unless MMS determines the proposed operations can be conducted without damage to the fragile biocenoses. Seismic-survey and support vessels shall not anchor in the vicinity of fragile biocenoses (e.g., the Boulder Patch, kelp beds) as identified by MMS or may be discovered by the operator during the course of their operations, unless there is an emergency situation involving human safety and there are no other feasible sites in which to anchor at the time. Permittees must report to MMS any damage to fragile biocenoses as a result of their operations.

(11) Seismic-survey and support vessels will minimize operations that require high-intensity work lights, especially within the 20-m-bathymetric contour, to minimize the potential for adverse impacts to marine birds.

(12) High-intensity lights will be turned off in inclement weather when the seismic vessel is not actively conducting surveys to minimize the potential for adverse impacts to marine birds; however, navigation lights, deck lights, and interior lights could remain on for safety.

(13) All bird-vessel collisions shall be documented. Minimum information will include species, date/time, location, weather, and operational status of the survey vessel when the strike occurred. If eiders or murrelets that are injured or killed through collisions are recoverable, seismic-survey personnel should contact the Fairbanks Fish and Wildlife Field Office, Endangered Species Branch, Fairbanks, Alaska, at 907-456-0499 for instructions on the handling and disposal of the injured or dead bird(s).

(14) Seismic-survey operators shall adhere to any mitigation measures identified by the FWS to protect polar bears from seismic-survey activities.

(15) Seismic survey operations are to conform with the following mitigation measures to ensure that seismic activities do not have an unmitigable adverse impact on subsistence uses of marine mammals. These include:

(A) for the purposes of reducing or eliminating conflicts between subsistence whaling activities and Shell's seismic program, the Holder of this Authorization will establish and operate at least five Communication Centers to be staffed by Inupiat operators. The Com-Centers will be

operated 24 hours/day during the 2007 fall subsistence bowhead whale hunt.

(B). Plan all vessel and aircraft routes to minimize any potential conflict with bowhead whale subsistence whaling activities. All vessels shall avoid areas of active or anticipated whaling activity.

(C) during the bowhead whaling season, aircraft shall not operate below 1500 ft unless approaching, landing or taking off, or unless engaged in providing assistance to a whaler or in poor weather (low ceilings) or other emergency situations.

(D) All geophysical activity in the Beaufort Sea and Chukchi seas shall be restricted from conducting seismic as set forth below:

(1) *Kaktovik*: No geophysical activity from the Canadian border to the Canning River (~146 deg. 4 min. W) from 25 August to the end of the fall bowhead whale hunt in Kaktovik and Nuiqsut;

(2) *Nuiqsut*: No geophysical activity from the Canning River (~146 deg. 4 min. W) to Point Storkersen (~ 148 deg. 45 min. W) from August 25th to the end of the fall bowhead whale hunt in Nuiqsut;

(3) *Barrow*: No geophysical activity from Pitt Point on the east side of Smith Bay (~ 152 deg. 15 min. W) to a location about half way between Barrow and Peard Bay (~157 deg. 20 min. W) from September 10 to the end of the fall bowhead whale hunt in Barrow.

(4) *Chukchi Sea*: Geophysical exploration may occur beginning July 20, but in any case no closer than 60 miles from the Chukchi Sea coast at any point.

(E) Upon notification by Com-Center operator of an at-sea emergency, the Holder of this Authorization shall provide such assistance as necessary to prevent the loss of life.

(F) Upon request for emergency assistance made by a subsistence whale hunting organization, or by a member of such an organization in order to prevent the loss of a whale. the Holder of this Authorization shall assist towing of a whale taken in a traditional subsistence whale hunt.

(G) Geophysical exploration may resume following the close of the fall 2007 bowhead whale subsistence hunt in Barrow, Wainwright, and Pt Hope.

(H)(1) Post-Season Review: No later than 90 days following the end of the fall 2007 bowhead subsistence hunt, Shell will host a joint meeting with all whaling captains of the Villages of Nuiqsut, Kaktovik and Barrow, the Inupiat Communicator(s) and with the Chairman and Executive Director of the AEWC at a mutually agreed upon place on the North Slope to review the results of the 2007 fall season (unless it is agreed by all designated individuals or their representatives that such a meeting should be held at a different location, should be postponed, or is not necessary.

(2) No later than 90 days following completion of geophysical operations in the Chukchi Sea, Shell will host a meeting in each of the following villages: Wainwright, Point Hope, and Barrow (or a joint meeting of the whaling captain from all these villages if the whaling captains

agree to a joint meeting) to review the results of operations and to discuss any concerns residents of those villages might have regarding the operations.

VI. CONSULTATION AND COORDINATION

Within the public review processes for the 2006 Final PEA, 2007 Final EIS for the Chukchi Sea Lease Sale 193, and 2007 Draft EIS for Seismic Surveys in the Chukchi and Beaufort Seas, NMFS and MMS have repeatedly and extensively solicited input from the public regarding potential effects from seismic survey activities. This has included several public comment periods, public hearings, outreach and scoping, and government-to-government meetings. These efforts began in early 2006 and have been directed at Federal and state agencies, Native Alaskan organizations, environmental groups, and the general public. The results of the input from the public received to date have been considered in developing this 2007 S-EA. Collectively, these consultations support this 2007 S-EA and subsequent environmental review of 2007 G&G permit and MMPA authorization.

The NMFS indicated that the findings in the 2006 ARBO are still relevant to the 2007 open water seismic survey season. In addition, because SOI is prohibited from transiting in the spring leads prior to July 1st, or conducting seismic surveys prior to July 15th, and because seismic surveys did not begin in 2007 until after August 24th (5 days after receiving an IHA), NMFS has determined that any taking by harassment of listed species (principally bowhead whales) in early summer 2008 to fall within that analyzed under the ESA during the 2007 consultation. After reviewing the proposed 2007 open water, seismic survey activities and considering mitigation measures, the FWS concluded (in a letter to MMS dated April 3, 2007) that the seismic survey work in the Chukchi and Beaufort seas will not adversely affect Steller's or spectacled eiders or Kittlitz's murrelets and further consultation under the ESA is not required. The FWS is developing their own NEPA and rulemaking processes to support any MMPA authorizations they may issue for seismic surveys in the Beaufort and Chukchi seas for the 2007 open water season.

VII. LIST OF PREPARERS AND CONTRIBUTERS

National Oceanic and Atmospheric Administration - NOAA Fisheries Service

Ken Hollingshead	Fishery Biologist

Minerals Management Service - Headquarters

Jill Lewandowski	Protected Species Biologist

Minerals Management Service - Alaska OCS Region

Deborah Cranswick	Supervisory Environmental Specialist, Environmental Assessment Section
Wayne M. Crayton	Biologist and NEPA Team Coordinator

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Finding of No Significant Impact
for the
Issuance of an Incidental Harassment Authorization to Shell Offshore, Inc. to Take Marine Mammals Incidental to Conducting Seismic Surveys in the Chukchi and Beaufort Seas off Alaska

Background: The National Marine Fisheries Service (NMFS) is in receipt of an application from Shell Offshore Inc. (SOI) (and WesternGeco) for an Incidental Harassment Authorization (IHA) to take marine mammals incidental to seismic surveys in the Beaufort and Chukchi Seas, Alaska. Pursuant to the Marine Mammal Protection Act, NMFS shall authorize the taking by harassment of small numbers of marine mammals of a species or population stocks incidental to an otherwise lawful activity (other than commercial fishing), provided that NMFS determines that the individual seismic actions will (1) have a negligible impact on the affected species or stocks of marine mammals; (2) not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses and (3) that the permissible methods of taking by harassment and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

NMFS has made such a determination in its authorization for the taking of marine mammals by harassment incidental to oil-and-gas seismic surveys by Shell in 2007 and early summer 2008 in the Chukchi Sea and Beaufort Sea off Alaska. NMFS was a cooperating agency in the preparation of both a Draft and Final Programmatic Environmental Assessment (PEA) prepared and submitted for public review by the Minerals Management Service (MMS) in connection with the subject MMS-permitting activity and the NMFS' issuance of IHAs in 2006. A Final PEA was released by MMS on June 22, 2006. For 2007, NMFS has prepared a Supplemental EA (S-EA) to update the 2006 Final PEA for an analysis for 2007 and NMFS' issuance of an IHA to SOI.

PEA/S-EA Analysis: The activities analyzed in the Final PEA/S-EA include conducting marine-streamer 3D and 2D seismic surveys, high-resolution site-clearance seismic surveys, and ocean-bottom-cable seismic surveys. The Final PEA and 2007 S-EA contain an analysis of the SOI project, analyzed the impacts of the subject action on various marine resources and human activities. Marine resources include fish, fisheries, marine mammals (including endangered marine mammals) and seabirds. The Final PEA's cumulative activities scenario and cumulative impact analysis focused on oil and gas-related and non-oil and gas-related noise-generating events/activities in both Federal and State of Alaska waters that were likely and foreseeable. Other appropriate factors, such as arctic warming, military activities and noise contributions from community and commercial activities were also considered.

The Final PEA and 2007 S-EA focused on analyzing the potential for adverse and significant impacts of these activities on environmental resources and identifying mitigation measures to avoid and/or minimize those impacts. The following more prominent issues and concerns were addressed in the Final PEA/S-EA: (1) Protection of subsistence resources and the Inupiat culture and way of life; (2) disturbance to bowhead whale-migration patterns; (3) impacts of seismic survey operations on marine fish reproduction, growth, and development; (4) harassment and potential harm of wildlife, including marine mammals and marine birds, by vessels operations

and movements; (5) impacts on water and air quality; (6) changes in the socioeconomic environment; (7) impacts to threatened and endangered species; (8) impacts to marine mammals; (9) incorporation of traditional knowledge in the decision-making process; and (10) level of implementation of marine mammal monitoring and other mitigation measures.

NMFS Determinations: Based on the Final PEA/S-EA examination of the potential impacts associated with the proposed action and a review of comments received from the public and agencies, NMFS has selected Alternative 6 (Title: Seismic Surveys for Geophysical- Exploration Activities would be Permitted with Existing Alaska OCS Geological and Geophysical Exploration Stipulations and Guidelines and Additional Protective Measures for Marine Mammals, Including a 180/190 dB-Specified Exclusion Zone) and associated mitigation measures, outlined here, as its Preferred Alternative. NMFS and MMS developed additional mitigation and monitoring measures within the Final PEA which were incorporated by reference into the S-EA to further reduce the level of any potential adverse effects. These additional measures, which were proposed by SOI and contained in their IHA application, have become part of NMFS' Preferred Alternative and were analyzed by NMFS as part of the specified activity. The suite of mitigation measures, described in Section V.B.1. and V.B.2. of the S-EA, will be implemented as requirements in SOI's 2007 IHA for open-water seismic survey activities. By incorporating these additional mitigation measures into the Preferred Alternative and designating them as IHA conditions, NMFS has determined that no significant impacts to the human environment would occur from implementing the Preferred Alternative.

In addition, SOI signed a Conflict Avoidance Agreement (CAA) with the Alaska Eskimo Whaling Commission (AEWC) and the affected villages' Whaling Captains Associations on July 24, 2007. The purpose of the CAA is to ensure that no unmitigable adverse impacts on subsistence uses of marine mammals would occur as a result of SOI's activities. NMFS will require SOI to abide by the terms of the CAA as part of its authorization to take marine mammals. These measures include a prohibition on conducting seismic surveys during the spring bowhead and beluga migration/subsistence hunting period in the Chukchi Sea, during the bowhead whale hunting season in the Beaufort Sea, dispute resolution, and emergency assistance to whalers at sea. Implementation of these measures ensures that there will not be significant social or economic impacts on the coastal inhabitants of the Beaufort and Chukchi seas or have an unmitigable adverse impact of the subsistence uses of marine mammals.

Significance Review:

National Oceanic and Atmospheric Administration Administrative Order 216-6 (NAO 216-6) (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant in making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria.

These include:

B1. Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat (EFH) as defined under the Magnuson-Stevens Act and identified in FMPs? The NMFS action (i.e., issuing an IHA to SOI) will not have a substantial long-term impact on the Arctic Ocean or its resources. Relatively short-term exposure to seismic sounds are unlikely to have significant impacts on marine life, although some deleterious effects may occur within the small high-intensity sound impact areas near the seismic vessels. Adult fish near seismic operations are likely to avoid the immediate vicinity of the source due to hearing the sounds at greater distances, thereby avoiding injury. The NMFS S-EA and the 2006 Final PEA indicate that impacts, if they were to occur, would add an incremental degree of adverse impacts to fish resources, but these impacts would not be significant.

The action area has been identified and described as EFH for 5 species of Pacific salmon (pink (humpback), chum (dog), sockeye (red), chinook (king), and coho (silver)) occurring in Alaska. The issuance of IHAs for SOI's Arctic Ocean seismic surveys in 2007 is not anticipated to have any adverse effects on EFH. Consultation with NMFS has been concluded indicating that there will not be an adverse effect on EFH.

B.2. Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc)? As the zone for potential acoustic injury is no more than about 250 m (820 ft) around the vessel, and the fact that most invertebrate marine life do not contain organs subject to injury by underwater sounds, NMFS believes that there will not be a substantial impact on marine life biodiversity or on the normal functioning of the nearshore or offshore Arctic Ocean ecosystems. Organisms with organs subject to injury by underwater sounds (e.g., fish) may be affected by (1) injury or mortality if within about 250 m (820 ft) of the seismic airgun array, (2) dispersal into nearby areas if the sounds are annoying to them, and/or (3) behavior modification resulting in reduced availability to fishermen. Most effects however, are considered to be short-term and unlikely to affect normal ecosystem function or predator/prey relationships..

B.3. Can the proposed action reasonably be expected to have a substantial adverse impact on public health or safety? This action will not have a substantial adverse impact on public health or safety. As described in B.5., mitigation measures imposed by the IHA will prohibit the industry from conducting the activity whenever natives are hunting bowheads. If, as claimed by hunters, seismic noise deflects the whale migration offshore, making them skittish and more difficult to harvest, then not conducting seismic activities during this time period does not increase the risk to human safety.

B.4. Can the proposed action reasonably be expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species? This action may adversely affect, but will not jeopardize the continued existence of, species listed

under the ESA. The ESA-listed species that might be affected by this action is the bowhead whale (fin whales and humpback whales are unlikely to be affected).

For bowhead whales, adverse effects will be limited to short-term behavioral disturbances that may constitute Level B harassment. No injury or mortality is expected due to bowhead whales avoiding active seismic operations by 20 km (12.4 mi) or more and other marine mammals likely taking similar actions to avoid the proximity of seismic vessels and the resultant noise. NMFS' biological opinion for this action supports this determination. Impacts to marine mammals, if any, are expected to be limited to short-term behavioral harassment. This action has been determined to be consistent with determinations made under section 101(a)(5)(D) of the MMPA as the taking of marine mammals by seismic survey activities in the Arctic Ocean will have a negligible impact on affected species and be at the lowest level practicable through implementation of mitigation and monitoring measures.

To prevent significant impacts during important life stages of the bowhead and gray whales, additional mitigation measures will be required. These measures were proposed by SOI and include: (1) Implementing a 120-dB monitoring-safety zone for concentrations of migrating bowhead cow/calf pairs in the U.S. Beaufort Sea and a 160-dB monitoring-safety zone for feeding concentrations of bowhead and gray whales in the Beaufort and Chukchi seas; (2) conducting dedicated aerial and vessel surveys of the 120-dB monitoring-safety zone in the Beaufort Sea, (3) conducting aerial and vessel surveys in the Beaufort Sea for feeding concentrations of bowhead and gray whales in the 160-dB monitoring-safety zone, and (4) conducting vessel surveys in the Chukchi Sea for feeding concentrations of bowhead and gray whales in the 160-dB monitoring-safety zone. Detection of aggregations of cow/calf pairs of bowheads and concentrated feeding areas for bowheads and gray whales will require a power-down/shut-down of the airgun array as stipulated in the IHA until the identified aggregation is no longer within the designated monitoring-safety zone.

Unlike 2006, NMFS is not requiring aerial surveys during the fall bowhead migration (searching for cow/calf pairs) in the Chukchi Sea because aerial surveys have currently been determined to be impracticable due to lack of adequate landing facilities, the prevalence of fog and other inclement weather in that area, thereby resulting in safety concerns. NMFS required in 2006, as part of seismic operations, implementation of passive acoustic detection and unmanned aerial vehicles (UAV). These measures are not being required in 2007 because they are not practicable. For example, in 2006, GX Technology used passive acoustics monitoring (PAM) in lieu of aerial surveys for detecting bowhead cow/calf pairs. However, operation of the PAM system was terminated early due to the erroneous belief that the Court-issued Stay in the CPAI litigation applied also to GXT. Moreover, NMFS determined that the passive acoustic program was not capable of detecting bowhead whales due to a lack of recorded vocalizations and excessive motor noises. This inability was confirmed during fall 2006 meetings with participants, who indicated that it was likely resolvable through engineering. These same problems arose with the use of passive acoustics onboard the industry-sponsored dedicated research vessel, *R/V Torsvik,* conducting research on marine mammals and seismic impacts in the Arctic in 2006. As a result,

NMFS will need to assess further whether passive acoustics can reliably detect bowhead whale movements and their location throughout the Arctic prior to adopting this technology as a standard monitoring tool. With regard to UAVs, NMFS scientists at the National Marine Mammal Laboratory (NMML) believe that additional testing is necessary to determine whether UAV's have the capability to locate and identify marine mammals prior to its use in Arctic waters. Preliminary scientific testing has been conducted by NMML and others at Friday Harbor, Washington in 2006. However, more testing is necessary before NMFS will give approval to its use as a monitoring tool. In addition, the Federal Aviation Administration (FAA) currently prohibits use of UAVs in U.S. airspace except under certain circumstances and with federal sponsorship. NMFS is aware of ongoing efforts to gain FAA approval to deploy and test the UAV system in the Arctic in order to assist in detecting marine mammals, but that approval will not be given for use in 2007. Should the FAA grant UAV approval for the Arctic in 2008 or beyond, NMFS would then make a final determination (informed by the results of additional UAV testing) whether UAVs are a practical tool to detect marine mammals in the Arctic.

In addition, due to only a single vessel operating in the Chukchi Sea this year, NMFS believes there is likely to be significantly fewer impacts on bowhead females and calves as compared to the multiple seismic surveys that were proposed to be conducted in the Chukchi Sea during the 2006 Arctic seismic season. As analyzed in Section III.A.2 of the S-EA, NMFS expects a 75 percent decrease in seismic activity this season as compared to 2006. However, NMFS is continuing its requirement for SOI to conduct aerial and vessel surveys in the Beaufort Sea during the fall migration period because (1) NMFS has been informed that it is relatively safe to conduct aerial monitoring in the Beaufort as compared to the Chukchi (e.g., there is a higher number of available landing areas along the Beaufort Sea coast; and there is a history of annual bowhead aerial surveys that have been conducted successfully by MMS and industry over the past 20 years, (2) this monitoring activity was proposed by SOI in its 2007 IHA application, (3) it is required in the CAA signed by SOI with the AEWC, and (4) from a biological perspective, the aerial monitoring would help ensure that bowhead whale fall feeding and migration activities are not adversely affected by seismic operations. One of the objectives of SOI's aerial monitoring program is to notify SOI of the presence of marine mammals in the general area of operation and to implement mitigation measures, such as shutting down the array or moving to a new location, if more than 3 bowhead whale cow/calf pairs are sighted within the 120-dB isopleth of the seismic vessel during the aerial survey or if 12 or more bowheads are seen feeding within the 160-dB isopleth of the seismic vessel. NMFS is requiring this mitigation measure to ensure that bowhead whales are not significantly impacted by the seismic vessel(s) such that they either remain east of the survey (as noticed during GXT's 2006 seismic survey in the Canadian Beaufort Sea), or migrate significantly north of its normal migratory route in order to avoid the seismic noise. NMFS believes that this is more critical for bowhead whales in the Beaufort Sea than in the Chukchi Sea because of the difference in size of the preferred migratory path in each sea (See NSB, 2003. Bowhead Whale Subsistence Sensitivity).

B.5. Are significant social or economic impacts interrelated with natural or physical environmental effects? Other than impacts to native subsistence needs and culture, this action

will not have a significant social or economic impact as there are no commercial fishing or other activities that might be affected by offshore seismic surveys for oil and gas deposits. Marine mammals are legally hunted in Alaskan waters by coastal Alaska Natives. The species hunted include bowhead and beluga whales; ringed, spotted, and bearded seals; walruses, and polar bears. The importance of each of the various species varies among the communities and is based largely on availability. Bowhead whales, belugas, and walruses are the marine mammal species primarily harvested during the time of the proposed seismic surveys. Bowhead whale hunting is the key activity in the subsistence economies of Barrow, Wainwright, Nuiqsut and Kaktovik. The whale harvests have a great influence on social relations by strengthening the sense of Inupiat culture and heritage in addition to reinforcing family and community ties. There is little or no bowhead hunting by the community of Point Lay, so beluga and walrus hunting are of more importance there. Because seals (ringed, spotted, bearded) are hunted in nearshore waters and the seismic survey will remain offshore of the coastal and nearshore areas of these seals, seismic surveys should not conflict with harvest activities.

To avoid having an unmitigable adverse impact on subsistence uses of marine mammals, NMFS is required to implement mitigation measures to ensure that SOI's seismic activities do not have an unmitigable adverse impact on subsistence uses of marine mammals. However, because SOI signed the 2007 CAA with the AEWC and the affected villages' Whaling Captains Association, NMFS has determined that there will not be an adverse impact on the species or stocks of marine mammals for subsistence uses. These mitigation measures include a prohibition on conducting seismic surveys during the spring bowhead and beluga migration hunting period, a prohibition on conducting seismic surveys during the fall bowhead whale hunting season in the Beaufort Sea, dispute resolution and emergency assistance to whalers at sea. Implementation of these measures ensure that there will not be a significant social or economic impacts on the coastal inhabitants of the Beaufort and Chukchi seas.

B.6. Are the effects on the quality of the human environment likely to be highly controversial?
There is a lack of agreement and some controversy within the scientific and stakeholder communities about the potential effects of noise on marine mammals, including in this instance, bowhead whales. This was demonstrated recently by the National Research Council (NRC, 20005) report and by the lack of consensus among participants in the Marine Mammal Commission's Sound Advisory Panel (MMS, 2006). The 2006 PEA considered and incorporated recommendations from the NRC (2005) in its analyses and conclusions about the potential significance of effects. Moreover, the analyses in the PEA are cautious in that we attempted to err on the side of overestimating potential effects, and then building in mitigation measures to reduce such potential effects. While any maritime noise issue can be considered controversial because of several marine mammal stranding incidents allegedly due to military sonar, comments from 7 industry groups (including 2 of the 3 oil companies and 2 contractors participating in the 2006 Arctic seismic activity), one environmental consortium and 3 native communities and organizations on the 2006 Draft PEA and NMFS' proposals to issue an multiple IHAs in 2006 mainly: (1) concerned requirements under NEPA and the MMPA; and (2) critiqued the mitigation and monitoring measures proposed by NMFS and MMS. Similar concerns were

expressed in 2007 even though seismic survey effort was reduced to a single seismic activity (SOI's proposal). In reviewing these concerns (which are addressed in NMFS' final IHA determination), NMFS believes that its actions are in full compliance with NEPA, the MMPA, the ESA and other statutes. As noted elsewhere in this Statement, NMFS is requiring, as proposed by SOI, a detailed mitigation and monitoring program designed to reduce impacts on affected marine mammal stocks to the lowest level practicable. In addition, the oil industry will jointly implement for the second year, a research program to address uncertainty on the status of Arctic Ocean marine mammal populations.

In 2006, industry concerns focused on the practicability of implementing some of the mitigation measures and the transfer of these mitigation measures to other areas of the world where oil and gas exploration occurs. These concerns were addressed in the IHA supporting documentation indicating that all IHAs are reviewed independently based upon the marine mammal species affected, the level of impact, and mitigation and monitoring measures required to reduce those impacts to the lowest level practicable and whether the activity would have an unmitigable adverse impact on subsistence uses of marine mammals. Inupiat concerns on the potential impact on their traditional lifestyle have been addressed through both the mitigation and monitoring measures in the IHA and the signed 2007 CAA. As a result, the industry will avoid significant cultural impacts. Little additional information on the scientific basis for NMFS' determinations has been provided by the public since last year. NMFS continues to make its determinations under the MMPA based on the best available science. As a result, while NMFS believes that offshore oil and gas exploration and development in U.S. waters is controversial, the activity proposed in the Arctic Ocean in 2007 is not highly controversial.

B.7. Can the proposed action reasonably be expected to result in substantial impacts to unique area, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas? Detailed information about the affected environment, bowhead whales, other marine mammals, and marine life are provided in the Final PEA/S-EA. The original affected environment in which this activity could have occurred included areas within the spring migratory pathway of the bowhead whale in the Chukchi and Beaufort seas; bowhead calving areas; the fall migratory pathway of the bowhead; and spring, summer, and fall bowhead feeding grounds. Mating can occur within the Beaufort and Chukchi seas area, but most mating probably occurs in the Bering Sea. NMFS and MMS attempted to substantially reduce the potential for significant effects on bowhead calving by building into the base action a ban on conducting seismic surveys during the spring bowhead migration period. As a result, seismic vessels will not transit the spring lead system before July 1st and will not conduct seismic surveys before July 15, 2008 at the earliest. While some calving may occur after this date, available data indicates that most of the calving has occurred before that time. This ban also should significantly reduce the possibility of dispersal or disruption of whales that are feeding within the spring lead system in the Chukchi Sea.

Thus, because of the bowhead migration, the spring lead system within the Chukchi Sea until July 15 is removed from the affected environment in which this action could now occur. Where

data are available and sufficient, NMFS has attempted to identify other areas where aggregations of bowheads are known to occur and where feeding aggregations repeatedly have been observed. NMFS has summarized information that is available about the timing of habitat use. Where analyses identified areas where effects to bowheads potentially could be significant, NMFS has identified monitoring and mitigation measures to reduce the potential for such impacts to non-significant levels. Such mitigation includes prohibiting in the Beaufort Sea, the generation of seismic sounds when 4 or more cow/calf pairs are detected visually or when feeding aggregations of bowhead or gray whales are sighted.

B.8. Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks? As discussed in the Final PEA, and incorporated by reference in the S-EA, there are limited data and, hence, uncertainty, on the current use of the Chukchi Sea by bowhead whales after the primary spring (northward) migration period (until approximately June 15th in most years). There is some, but less uncertainty about bowhead use of the Beaufort Sea for feeding during the summer before September 1. There is remaining uncertainty about the importance of feeding areas within the Alaska Beaufort Sea, especially the western Alaskan Beaufort Sea, to the bowhead population as a whole and, more specifically, to certain segments of the population. While it is clear that there is interannual variability in the use of the Beaufort Sea for feeding by bowheads, the factors underlying such variability are not entirely clear. More importantly, the importance of the areas to segments of the population and to the population as a whole during years when large aggregations are observed feeding is unclear. There also is uncertainty about the potential effects of such disturbance to the health of females and young calves and to the next year's reproductive potential of adult females. There is uncertainty about the effects of sound on the hearing of very young calves. In the Final PEA analyses, we acknowledge this uncertainty and, where it exists, have designed appropriate and practicable mitigation measures aimed at reducing this uncertainty and to reduce the potential for there to be adverse effects on bowhead whales, especially cow/calf pairs. In the Final PEA, NMFS reviewed this information and stated that imposition of these additional mitigation and monitoring measures should resolve uncertainty and further reduce the level of any potential impacts on marine mammal species, particularly the bowhead whale, and any other marine biological resources. In the S-EA, NMFS again reviewed this information and determined that, because only one seismic vessel will be operating in the Chukchi Sea and 2 vessels in the Beaufort Sea, and not necessarily at the same time, impacts to bowhead whale, especially cow/calf pairs is likely to be significantly reduced (up to about 75 percent). As a result, bowheads are unlikely to be significantly affected either through opportunistic feeding or through extensive deviation of their migratory path in the Chukchi Sea. As a result, we have determined that the 2006 mitigation/monitoring requirement to establish and monitor a 120-dB zone around the survey vessel for bowhead whale cow/calf pairs in the Chukchi Sea is no longer necessary for reasons of safety, and the fact that seismic effort will be reduced substantially as compared to the 2006 season. However, monitoring of the 120-dB zone in the Beaufort Sea will be implemented as it is a part of SOI's submitted monitoring plan and required by the signed CAA.

B.9. Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts? There are other seismic survey activities in Alaskan waters and around the world that may result in the harassment, injury or mortality of marine mammals, but most are dispersed both geographically and temporally (Gulf of Mexico, North Sea, West Africa), are relatively short-term in nature, and all either currently use, or will likely use in the future, standard mitigation and monitoring measures to minimize impacts to marine life. Within the Beaufort and Chukchi seas there are other activities, such as oil-and-gas exploration and production and scientific seismic activities (in 2007, the *USCG CutterHealy* is conducting bathymetric multi-beam sonar surveys for NOAA approximately 200 miles north of Barrow). However, these activities (most of which are subject to NEPA review) are temporally dispersed, relatively short-term (except for the Northstar facility) and use appropriate mitigation designed to reduce impacts on marine life to the lowest level practicable. In addition to deep seismic surveys, SOI also plans to conduct site clearance and shallow hazard surveys of potential exploratory drilling locations within Shell's lease areas in the Beaufort Sea. The site clearance surveys are confined to very small specific areas within defined OCS blocks. Very small and limited geophysical survey energy sources will be employed to measure bathymetry, topography, geo-hazards and other seabed characteristics. Also, in 2007, there will be a single offshore oil exploration activity in the U.S. Beaufort Sea. Using two drilling vessels and support vessels (including ice management vessels), SOI plans to conduct an oil drilling project at the Sivulliq prospect, located in Camden Bay in the U.S. Beaufort Sea. Although currently under a court-ordered Stay which prohibits any oil exploration, if this project takes place in 2007, it will have mitigation measures imposed by the CAA and an IHA if found to be appropriate (such as a prohibition of drilling activities during the fall bowhead migration) that will ensure that impacts on marine mammals (particularly the endangered bowhead whale) are negligible and that the oil exploration project is not having an unmitigable adverse impact on subsistence uses of marine mammals. Finally, this area is also not known for heavy ship traffic, mostly being barge traffic to supply villages and onshore and offshore oil facilities. Thus, as all activities (other than village barging activities) are under IHAs reducing impacts to the lowest level practicable through mitigation measures tailored to the specific activity, NMFS believes that the cumulative effect of SOI's deep and shallow seismic survey program in combination with SOI's drilling program (assuming the court-ordered Stay is lifted), and other nearby projects (e.g., Northstar, barging) will not result in significant cumulative impacts.

B.10. Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources? The action proposed by NMFS will have some potential to adversely affect native cultural resources along the Arctic Coast. As described in B.5, implementation of mitigation measures in the IHA issued to SOI and under the signed CAA between industry and the native whaling communities ensures that there will not be a significant social or economic impacts on the coastal inhabitants of the Beaufort and Chukchi seas nor an unmitigable adverse impact of the subsistence uses of marine mammals by these residents.

B.11. Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species. This factor is not implicated.

B.12. Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration? This action will not set a precedent for future actions with significant effects or represent a decision in principle. NMFS' actions under section 101(a)(5)(D) of the MMPA must be based on the best available information, which is continuously evolving. Moreover, each action for which an incidental take authorization is sought must be considered in light of the specific circumstances surrounding the action. Mitigation and monitoring vary depending on those circumstances. In addition, the 2006 Final PEA evaluated the potential effects of seismic survey activities that could occur in the 2007 open water (ice-free) season. Regarding bowhead whales, there is extensive history and regulatory and procedural structure to evaluate the effects of seismic survey noise on bowhead whales and other marine mammal species. For these reasons, NMFS does not believe that issuance of an IHA for seismic activities in the Arctic Ocean in 2007 is precedent setting.

B.13. Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment? If seismic surveys were conducted without authorizations under the MMPA, violations of the MMPA and the ESA could result. However, the proposed seismic survey and the Final PEA/S-EA require that operators obtain an MMPA authorization prior to commencement of seismic survey activity authorized under an MMS permit. For this reason, this action does not threaten a violation of any such laws or requirements. Moreover, all other applicable law has been complied with as it relates to issuance of the IHA.

B.14. Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species? This action will not target any marine species, but may affect certain non-target species, such as cetaceans and pinnipeds in the area, particularly bowhead and gray whales. With a single deep seismic survey vessel operating in the Chukchi and Beaufort seas, another deep seismic survey vessel operating in the Canadian Beaufort Sea, and a shallow-hazards seismic vessel operating in the U.S. Beaufort Sea in 2007, cumulative impacts are possible if seismic vessels were to adversely impact marine mammals during critical life cycle periods, such as migration and concentrated feeding. In order to avoid, or if not possible, at least minimize cumulative adverse effects, NMFS is requiring seismic operations in the Chukchi and U.S. Beaufort seas to implement mitigation measures, such as monitoring exclusion zones to prevent injury and safety zones in the U.S. Beaufort Sea to ensure that bowhead and gray whales are not significantly affected during important periods of feeding (bowheads and grays) and migration (bowhead cow/calf pairs). However, due to the relatively large habitat area for marine mammals in the Arctic Ocean and the small areas of the Chukchi and Beaufort seas that are of interest for conducting seismic surveys in 2007, the relatively short time that seismic operations will be in the area (mid-July to mid-November), the disbursed nature of marine mammals (particularly pinnipeds), the relatively low density of all marine mammal species in these waters, avoidance behavior by some species

(bowheads and belugas) to the activity area, and the implementation of mitigation measures (e.g., black-out periods), NMFS does not believe that cumulative effects by the subject seismic surveys. To reduce potential impacts to the lowest level practicable, spatial and temporal separation of seismic survey vessels will be implemented by the vessel operators, and additional mitigation and monitoring measures proposed by SOI and required by NMFS will be implemented during the 2007 seismic season.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Supplemental EA prepared for issuance of an Incidental Harassment Authorization to SOI. to take marine mammals incidental to conducting seismic surveys in the Chukchi and Beaufort Seas off Alaska, it is hereby determined that the issuance of this IHA will not significantly impact the quality of the human environment as described above and in the supporting Supplemental EA. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not necessary.

for James Lecky 8/20/07

Director, Office of Protected Resources
National Marine Fisheries Service

Date