

**Finding of No Significant Impact for the Issuance of an  
Incidental Harassment Authorization to PGS Onshore, Inc. to  
Take Marine Mammals Incidental to an Ocean-bottom Cable/Transition  
Zone Seismic Survey in the Beaufort Sea, Alaska in 2008  
National Marine Fisheries Service**

Background

The National Marine Fisheries Service (NMFS) received an application from PGS Onshore, Inc. (PGS) for an incidental harassment authorization (IHA) pursuant to NMFS' responsibility to authorize the take of small numbers of marine mammals incidental to an otherwise lawful activity other than commercial fishing, provided that NMFS determines that the action will have a negligible impact on the affected species or stocks of marine mammals, will not have an unmitigable adverse impact on the availability of those species or stocks of marine mammals for taking for subsistence uses, and that the permissible methods of taking and requirements pertaining to the mitigation, monitoring, and reporting of such takes are set forth. NMFS has satisfied those requirements for this authorization for the take of small numbers of six species of marine mammals, by Level B Harassment only, incidental to the seismic survey in the Beaufort Sea, Alaska, in 2008.

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 NMFS' issuance of IHAs in 2006. A Final PEA for "Arctic Ocean Outer Continental Shelf Seismic Surveys—2006" was released by MMS on June 22, 2006 and adopted by NMFS. For 2008, NMFS has prepared a Supplemental EA (2008 SEA) to update the 2006 Final PEA for analysis of arctic seismic survey incidental take authorizations for 2008, including NMFS' issuance of an IHA to PGS for the 2008 season.

PEA/SEA Analysis

The activities analyzed in the Final PEA/SEA include conducting marine-streamer 3D and 2D seismic surveys, high-resolution site-clearance seismic surveys, and ocean-bottom-cable (OBC) seismic surveys. The Final PEA and 2008 SEA contain analysis of the impact of an OBC seismic survey, such as the one proposed by PGS, on various marine resources and human activities. For purposes of this finding, NMFS analyzed the impact of PGS' survey on fish, marine mammals (including endangered marine mammals) and their habitats, 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 occurred in the past and which were likely and reasonably foreseeable. Other past, present, and reasonably foreseeable actions, such as arctic warming, military activities, and noise contributions from community and commercial activities were also considered. The cumulative impacts analysis was updated in the SEA to include additional activities

and analyses of oil and gas exploration in the region since 2006 and newer information related to arctic warming.

The Final PEA and 2008 SEA analyzed the potential for significant impacts of these activities on environmental resources and identified mitigation measures to avoid and/or minimize those impacts. The following were considered the meaningful resources and issues warranting detailed description and analysis in the Final PEA/2008 SEA: (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 to 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/SEA, an examination of the potential impacts associated with the proposed action and a review of comments received from the public and agencies during the Marine Mammal Protection Act (MMPA) process, NMFS has selected Alternative 6 (Title: 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 associated mitigation measures as its action. In addition to the 180/190 dB specified exclusion zones, NMFS and MMS developed mitigation and monitoring measures within the Final PEA which were incorporated by reference into the SEA to further reduce the level of any potential adverse effects. These additional measures, several of which were proposed by PGS and contained in their IHA application, are part of NMFS' Preferred Alternative as described in the 2008 SEA and were analyzed by NMFS as part of the specified activity. Mitigation measures described in Sections V.B.1. and V.B.2. of the 2008 SEA that are relevant to seismic survey operations in the Beaufort Sea will be included as conditions in PGS' 2008 IHA for open-water seismic survey activities in the Beaufort Sea. Based on NMFS' review of PGS' proposed action, the measures contained in Alternative 6, and the additional mitigation and monitoring requirements, NMFS has determined that no significant impacts to the human environment would occur from implementing the selected alternative (i.e., Alternative 6).

In addition, PGS signed a Conflict Avoidance Agreement (CAA) with the Alaska Eskimo Whaling Commission (AEWC) and the affected villages' Whaling Captains Associations on June 23, 2008. The purpose of the CAA is to mitigate the potential impacts of oil and gas exploration, drilling, seismic, development, or production and related activities on marine mammals, including migrating bowhead whales and the Alaskan Eskimo Subsistence hunt of those whales. NMFS will require PGS to abide by the terms of the

CAA as part of the IHA. These measures include black-out times and areas, a dispute resolution process, and provisions for emergency assistance to whalers at sea. Implementation of these measures provides additional assurance that there will not be significant social or economic impacts on the coastal inhabitants of the Beaufort Sea or an unmitigable adverse impact on the availability of those species or stocks of marine mammals for taking for subsistence uses.

### Significance Review

National Oceanic and Atmospheric Administration Administrative Order (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 (CEQ) 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 to 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 NOAA’s criteria and CEQ’s context and intensity criteria. These are:

1) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish (EFH) habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act and identified in fishery management plans?

Response: NMFS does not anticipate that the proposed activity and NMFS’ action (i.e., issuing an IHA to PGS) would cause substantial damage to the ocean and coastal habitats. Relatively short-term exposure to seismic sounds (approximately 75 days of seismic shooting) is 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. Although OBCs and geophones for seismic recordings would be deployed during the surveys, the OBCs and geophones would be promptly retrieved upon survey completion, and the cables and geophones would not be expected to damage or alter the benthic habitat because of the minimal amount of time that the equipment will be deployed. (Cables and geophones will be retrieved and then relayed throughout the operation.) 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 SEA 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 five species of Pacific salmon (pink [humpback], chum [dog], sockeye [red], chinook [king], and coho [silver]) occurring in Alaska. The issuance of an IHA for PGS’ Arctic Ocean OBC seismic survey in 2008 is not anticipated to have any adverse effects on EFH. EFH consultations with the NMFS Office of Habitat Conservation on arctic seismic activities were completed in 2006 and summarized in the PEA. Consistent with the 2006 determinations, NMFS finds that there will not be substantial damage to EFH as a result of the proposed seismic

survey, as it falls within the scope of the 2006 consultation. Therefore, additional consultation for EFH would not be needed unless implementation of the plan or operational conditions changes.

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.)?

Response: NMFS does not expect the proposed action will have a substantial impact on biodiversity or ecosystem function within the affected area. The impacts of the seismic survey action on marine mammals are specifically related to the acoustic activities, and these are expected to be temporary in nature and not result in a substantial impact to marine mammals or to their role in the ecosystem. In accordance with selected alternative 6, the IHA anticipates, and will authorize, the take, by Level B Harassment (temporary behavioral disturbance) only, of three species of cetaceans and three species of pinnipeds. However, neither injury nor mortality is anticipated nor authorized, and the Level B Harassment of marine mammals is not expected to affect biodiversity or ecosystem function.

The potential for the PGS activity to affect other ecosystem features and biodiversity components, including fish, invertebrates, seabirds, and physical features, is fully analyzed in the PEA and incorporated by reference into the 2008 SEA. NMFS' evaluation indicates that any direct, indirect, or cumulative effects of the action would not result in a substantial impact on biodiversity or ecosystem function. In particular, the potential for effects to these resources are considered here with regard to the potential effects on diversity or functions that may serve as essential components of marine mammal habitat. Most effects are considered to be short-term and unlikely to affect normal ecosystem function or predator/prey relationships; therefore, NMFS believes that there will not be a substantial impact on marine life biodiversity or on the normal function of the nearshore or offshore Beaufort Sea ecosystems.

During the seismic survey, only a small fraction of the available habitat would be ensonified at any given time. Disturbance to fish species would be short-term, and fish would return to their pre-disturbance behavior once the seismic activity in a specific area ceases. Thus, the proposed survey would have little, if any, impact on the ability of marine mammals to feed in the area where seismic work is conducted.

Some mysticetes, including bowhead whales, feed on concentrations of zooplankton. Some feeding bowhead whales may occur in the Alaskan Beaufort Sea in July and August, and others feed intermittently during their westward migration in September and October (Richardson and Thomson [eds.], 2002; Lowry et al., 2004). A reaction by zooplankton to a seismic impulse would only be relevant to whales if it caused concentrations of zooplankton to scatter. Pressure changes of sufficient magnitude to cause that type of reaction would probably occur only very close to the source, if any would occur at all. Impacts on zooplankton behavior are predicted to be negligible, and that would translate into negligible impacts on availability of mysticete

prey. More importantly, bowhead whales, while possible, are not expected to feed in the shallow area covered by this seismic survey; therefore, no impacts to mysticete feeding are anticipated.

Little or no mortality to fish and/or invertebrates is anticipated. The proposed Beaufort Sea seismic survey is predicted to have minor physical effects on the various life stages of fish and invertebrates. Though these effects do not require authorization under an IHA, the effects on these features were considered by NMFS with respect to consideration of effects to marine mammals and their habitats, and NMFS finds that these effects from the survey itself on fish and invertebrates are not anticipated to have a substantial effect on biodiversity and/or ecosystem function within the survey area.

3) Can the proposed action reasonably be expected to have a substantial adverse impact on public health or safety?

Response: NMFS does not expect the seismic survey or the issuance of an IHA associated with the survey to have a substantial adverse impact on public health or safety. The constant monitoring for marine mammals and other marine life during seismic operations effectively eliminates the possibility of any humans being inadvertently exposed to levels of sound that might have adverse effects. As described in question 5 below, mitigation measures imposed by the IHA will prohibit PGS from conducting the activity in areas where natives are hunting bowheads in the Beaufort Sea. Although the nature of the seismic survey does not preclude the potential for injury or mortality of involved personnel (i.e., boat or mechanical accidents during surveys), the applicant and those individuals working with the applicant would be required to be adequately trained or supervised in performance of the underlying activity (i.e., the seismic survey) to minimize such risk to personnel.

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?

Response: NMFS has determined that the proposed seismic survey may result in some Level B Harassment (in the form of short-term and localized changes in behavior) of small numbers, relative to the population sizes, of six species of marine mammals. No injury or mortality is anticipated or authorized. Behavioral effects may include temporary and short-term displacement of marine mammals from within certain ensonified zones, generally within 0.13 to 1.8 mi from the source vessel for the 880 in<sup>3</sup> airgun array. The mitigation measures required for the activity are designed to minimize the exposure of marine mammals to sound and to minimize conduct of the activity in the vicinity of habitats that might be used by certain cryptic marine mammals (i.e., those that are more difficult to detect).

Taking into account the mitigation measures that are planned (speed or course alteration when a marine mammal appears likely to enter the safety zone, power-down procedures when marine mammals are detected within or about to enter the safety zone, shutdown procedures when marine mammals are detected in the safety zone while the

airgun array is at full volume or during a power-down, and ramp-up procedures), effects on marine mammals from the selected alternative are expected to be limited to avoidance of the area around the seismic operation and short-term behavioral changes, falling within the MMPA definition of "Level B harassment". Speed or course alteration helps to keep marine mammals out of the 180 or 190 dB safety zones. Additionally, power-down and shutdown procedures are used to prevent marine mammals from exposure to received levels that could potentially cause injury. Ramping-up provides a "warning" to marine mammals in the vicinity of the airguns, providing them time to leave the area and thus avoid any potential injury or impairment of hearing capabilities. Because these mitigation measures will be included in the IHA to PGS, no marine mammal injury or mortality is anticipated. Numbers of individuals of all species taken are expected to be small (relative to species abundance), and the take is anticipated to have a negligible impact on the affected species or stock.

This action may adversely affect, but will not jeopardize the continued existence of species listed under the Endangered Species Act (ESA). The ESA-listed species that might be affected by this action is the bowhead whale (fin whales and humpback whales are not expected in the PGS project area).

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 to avoid the proximity of seismic vessels and the resultant noise. The Arctic Regional Biological Opinion (ARBO) issued by NMFS on July 17, 2008, 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 or stocks and be at the lowest level practicable through implementation of mitigation and monitoring measures. Migrating bowhead whales are not expected in the proposed survey area during July and August. Although PGS plans to conduct seismic operations during the fall bowhead migration westward towards the Chukchi Sea, data acquisition will only occur inside the barrier islands beginning on August 25 until the conclusion of the fall bowhead subsistence hunt in Nuiqsut in the Beaufort Sea. PGS' activities will remain within 5 km (3 mi) from shore, thus avoiding the main migration corridor. Additionally, the animals are not expected to be found inside the barrier islands because of the shallow depths, which is not considered suitable bowhead whale habitat. Moreover, a 160-dB vessel monitoring zone for bowhead and gray whales will be established and monitored after August 25 in the Beaufort Sea during all seismic surveys. Whenever an aggregation of bowhead or gray whales (12 or more whales) are observed during an aerial or vessel monitoring program within the 160-dB safety zone around the seismic activity (2,894 m [1.8 mi] for PGS' survey), the seismic operation will not commence or will shutdown, until two consecutive surveys (aerial or vessel) indicate they are no longer present within the 160-dB radius.

5) Are significant social or economic impacts interrelated with natural or physical environmental effects?

Response: This action will not have a significant social or economic impact to commercial fishing or other activities that might be affected by offshore seismic surveys for oil and gas deposits. Since some behavioral harassment of marine mammals is anticipated, the impacts to subsistence needs and culture were fully analyzed in the supporting PEA/SEA. Because the impacts of the PGS surveys are within the range of impacts previously analyzed, the harassment will be authorized. 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. (Note that walrus and polar bears are under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) and therefore are not considered further in this determination of NMFS' issuance of an IHA.) The importance of each of the various species varies among the communities and is based largely on availability. Bowhead whales 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 and Nuiqsut, the two communities closest to PGS' activities. 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. The project area is located 260 km (160 mi) east of Point Barrow; therefore, it is anticipated that the project will not impact the Barrow fall hunt. The Nuiqsut fall bowhead hunt takes place in the vicinity of Cross Island, ranging from the island to approximately 50 km (30 mi) north of the island. PGS' activity is located approximately 60 km (37 mi) west of Cross Island and is in water too shallow (less than 15 m [50 ft] deep) to support bowhead whales. It is unlikely that the Nuiqsut fall hunt would extend to the project area. Harvesting of beluga whales does not occur in the area during the time of the proposed seismic survey. Ringed seals are available year-round; however, the seismic survey will not occur during the primary period when these seals are typically harvested (i.e., October through June). Although there is a small bearded seal hunt at Thetis Island in July (and sometimes into August), as a result of negotiations with the Kuukpikmiut Subsistence Oversight Panel, Inc., PGS has agreed to conduct activities away from Thetis Island at the beginning of the project in order to avoid conflicts with subsistence hunters. Thus, there is no reason to expect a conflict between seismic surveys and a subsistence harvest activity.

PGS signed the 2008 CAA with the AEWC and the affected villages' Whaling Captains' Association. The CAA provides additional assurance that PGS' activities would not result in an unmitigable adverse impact on the availability of those species or stocks of marine mammals for taking for subsistence uses. The CAA terms that will be incorporated into the IHA as mitigation measures include a prohibition on conducting seismic surveys during the fall bowhead whale hunting season in the Beaufort Sea, a dispute resolution process, and provisions for emergency assistance to whalers at sea. However, PGS has received a waiver from the AEWC to conduct activities during the fall hunt, as long as the activities occur in the shallow waters inside the barrier islands. Because of the shallow water depths, the moderate size of the airgun array, and the

location of the activities inside the islands, sound is not expected to propagate into the main migration corridor, thereby minimizing effects to marine mammals. Consequently, PGS' seismic activity is unlikely to conflict with the native hunters. Implementation of the IHA measures ensures that there will not be significant social or economic impacts on the coastal inhabitants of the Beaufort Sea. While the CAA only seeks to resolve conflicts regarding the subsistence use of bowhead whales, NMFS has determined (based on the above stated reasons and NMFS' record) that PGS' activities will not have an unmitigable adverse impact on the subsistence uses of the other species hunted by Alaska Natives.

6) Are the effects on the quality of the human environment likely to be highly controversial?

Response: There is a lack of agreement 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, 2005) report and by the lack of consensus among participants in the Marine Mammal Commission's (MMC) Advisory Committee on Acoustic Impacts on Marine Mammals (MMS, 2006). The 2006 PEA considered and incorporated recommendations from the NRC (2005) in its analyses and conclusions about the potential significance of effects. Additionally, the Draft PEA was released for public comment, and those comments were considered in the finalization of the PEA. Moreover, the analyses in the PEA are cautious in that NMFS and MMS attempted to err on the side of overestimating potential effects, and then building in mitigation measures to reduce such potential effects. Comments on the Draft 2006 PEA and NMFS' proposals to issue multiple IHAs in 2006 from seven industry groups (including two of the three oil companies and two contractors participating in the 2006 Arctic seismic activity), one environmental consortium, and three native communities and organizations focused mainly on: (1) questions and concerns related to NMFS' compliance with the National Environmental Policy Act (NEPA) and the MMPA; and (2) criticism of the mitigation and monitoring measures proposed by NMFS and MMS. Similar concerns were expressed in response to the release of the proposed PGS IHA in 2008. In reviewing these concerns (which are more specifically addressed and will be publicly available in NMFS' final IHA determination), NMFS believes that its actions are in full compliance with NEPA, the MMPA, and the ESA. As noted elsewhere in this Finding of No Significant Impact, NMFS is requiring, as proposed by PGS, a detailed mitigation and monitoring program designed to gather additional data and reduce impacts on affected marine mammal stocks to the lowest level practicable. In addition, the oil industry will jointly implement for the third year, a research program to gather additional data 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 2006 final IHA *Federal Register* notices, 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. Specific to the PGS application, a notice of receipt and request for 30-day public comment on the application and proposed authorization was published in the *Federal Register* on June 17, 2008 (73 FR 34254). During the comment period, NMFS received five sets of comments from the following groups and organizations: the MMC; the AEW; the NSB and the NSB Department of Wildlife Management; the Center for Biological Diversity and Pacific Environment; and Resisting Environmental Destruction on Indigenous Lands and the Native Village of Point Hope. 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 2008 CAA. As a result, the industry will avoid significant sociocultural impacts. Little additional information that would augment or contradict the scientific basis for NMFS' determinations has been provided through public comment on the IHA, and 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 of concern to certain members of the public, the activity proposed by PGS in the Beaufort Sea in the Arctic Ocean in 2008 is not highly controversial.

7) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas?

Response: NMFS does not anticipate any substantial impacts to park land, prime farmlands, wetlands, or wild and scenic rivers as a result of conducting the proposed OBC seismic survey. Similarly, NMFS does not expect any substantial impacts to EFH as described in the response to question 1 above. Detailed information about the affected environment, bowhead whales, other marine mammals, and marine life are provided in the Final PEA and 2008 SEA. NMFS and MMS agreed 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. Additionally, during the bowhead whale western migration through the Beaufort Sea, PGS will work in shallow waters close to shore inside the barrier islands. Therefore, the migration pathways for the species should not be affected by the proposed activities.

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. In the 2008 SEA, 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 after August 25 in the Beaufort Sea, the generation of seismic sounds when four or more cow/calf pairs are detected visually within the 120-dB isopleths generated from the source vessels or when aggregations of 12 or more bowhead or gray whales are sighted within the 160-dB isopleths generated by the airgun array on the source vessels.

8) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Response: As discussed in the Final PEA, and incorporated by reference in the 2008 SEA, more information is needed about the importance of feeding areas within the Alaskan Beaufort Sea during the summer (i.e., before September 1), 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 (MMS, 2006). 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.

More information is needed about the potential effects of disturbance from single vessel and multiple seismic vessels operating concurrently to the health of females and young calves and to the next year's reproductive potential of adult females. There is a current lack of scientific data about the effects of sound on the hearing of mysticete whales, particularly very young calves. In the Final PEA analyses, MMS and NMFS acknowledged that more information was needed and designed appropriate and practicable mitigation measures aimed at gathering additional data on these species while also reducing the potential for adverse effects on bowhead whales, especially cow/calf pairs. In the 2008 SEA, NMFS again reviewed this information and determined that, because only two other companies will be conducting a seismic survey in the Beaufort Sea with some overlap to PGS' activities, impacts to bowhead whales, especially cow/calf pairs, are likely to be reduced appreciably in comparison to the analysis in the PEA. To further reduce the impacts to cow/calf pairs, NMFS will require PGS to monitor a 120-dB safety zone through aerial surveys. If four or more cow/calf pairs are observed within the area where an ensonified 120-dB zone around the vessel's track as projected for the next 24 hours, no seismic surveying shall occur within the 120-dB safety zone around the area where these whale cow/calf pairs 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. If four or more cow/calf pairs are sighted within the 120-dB isopleths of active operations, the airgun array will be shutdown upon notification of the presence of the animals. PGS will also be required to monitor a 160-dB safety zone for aggregations of 12 or more bowhead or gray whales and shutdown the airguns if an aggregation is sighted within this radius.

NMFS has reviewed the 90-day marine mammal monitoring and mitigation reports for the 2006 and 2007 open water seismic survey and shallow hazard and site clearance survey conducted by Shell Offshore Inc. (SOI), ConocoPhillips Alaska Inc., and GX Technology in 2006 and by SOI in 2007 (Ireland *et al.*, 2007a; 2007b; Patterson *et al.*, 2007; Funk *et al.*, 2007; 2008). The results of these studies suggest that mitigation and monitoring requirements specified in past seismic IHAs prevented marine mammals from being exposed to received sound levels that resulted in serious injury or mortality.

In addition, actual take of marine mammals by Level B harassment was generally lower than expected due to the implementation of monitoring and mitigation measures.

9) Is the proposed action related to other actions with individually insignificant but cumulatively significant impacts?

Response: There are other seismic survey activities in Alaskan waters and around the world that may impact marine mammals, but most are dispersed both geographically and temporally (Gulf of Mexico, North Sea, West Africa), are relatively short-term in nature, and most either currently use, or will likely use in the future, standard mitigation and monitoring measures to minimize impacts to marine life. Within the Beaufort Sea there are other activities, such as oil-and-gas exploration and production (four other companies have applied for IHAs to conduct seismic surveys in 2008 in the Arctic Ocean) and scientific seismic activities (in 2008, the U.S. Coast Guard *Cutter Healy* is conducting bathymetric multi-beam sonar surveys for NOAA approximately 200 mi north of Barrow). However, these activities 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. Finally, this area is not known for heavy ship traffic and is primarily used for barge traffic to supply villages and onshore and offshore oil facilities. PGS' activities will only occur for approximately 75 days and take only small numbers of each species by behavioral disturbance would be authorized, and no serious injury or mortality is expected or authorized. While it is possible that animals may experience multiple behavioral disturbance incidents due to the planned conduct of other actions in the larger Arctic Ocean, the potential for multiple, cumulative impacts to marine mammals is considered remote due to the distance between surveys, the short term nature of anticipated behavioral effects, and the separation in time of disturbance from past activities. Moreover, for the early part of activities many of the cetacean species are not expected to occur in the project areas. Additionally, since mitigation and monitoring measures are in place or would be required for all actions that require MMPA take authorization, each action's effects would be managed to ensure the least practicable adverse impact to marine mammal species or stocks. Since fish and their habitats would be expected to be impacted only very close to an acoustic source, PGS' activities would not be expected to incrementally contribute to cumulatively significant impacts to fish or fish stocks, nor to their availability for harvest or as prey.

10) Is the proposed action likely to adversely affect district, 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 historic resources?

Response: The action proposed by NMFS will have some potential to adversely affect native cultural resources along the Arctic Coast. However, as described in question 5 above, implementation of mitigation measures in the IHA issued to PGS and under the signed CAA between PGS and the native whaling communities ensures that there will not be significant social or economic impacts on the coastal inhabitants of the Beaufort Sea or an unmitigable adverse impact of the subsistence uses of marine mammals by these residents. The proposed action is not likely, directly or indirectly, to

adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, as none are known to exist at the site of the proposed action.

11) Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?

Response: The primary concern regarding the introduction or spread of a non-indigenous species from the proposed seismic survey is through ballast water exchange. PGS is responsible for ensuring that their ships are in compliance with all international and U.S. national ballast water requirements. NMFS does not believe that there is a high likelihood that the proposed seismic survey could result in the spread of a non-indigenous species.

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?

Response: This action will not set a precedent for future actions with significant effects or represent a decision in principle. To ensure compliance with statutory and regulatory standards, NMFS' actions under section 101(a)(5)(D) of the MMPA must be considered individually and 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, and mitigation and monitoring may vary depending on those circumstances. In addition, the 2006 Final PEA, the 2007 SEA, as well as the 2008 SEA, evaluated the potential effects of seismic survey activities that could occur in the 2008 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 to PGS to conduct a 3D OBC seismic survey in the Beaufort Sea in 2008 is precedent setting.

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?

Response: NMFS does not expect this action to violate any Federal law or requirements imposed for the protection of the environment, as responsibilities under Section 7 of the ESA have been fulfilled (see response to question 4 above) and the action itself would result in issuance of an IHA in compliance with all standards required under the MMPA. Note that the Section 7 consultation for the species under USFWS jurisdiction also was initiated by MMS, and MMS would be expected to complete that consultation and must comply with any required measures or conditions resulting from either the NMFS or USFWS Biological Opinions and Incidental Take Statements. Additionally, PGS has completed a coastal consistency determination pursuant to the Coastal Zone Management Act with the Division of Coastal and Ocean Management (DCOM) in the State of Alaska's Department of Natural Resources. DCOM concurs that

the project, as described by PGS, is consistent with the Alaska Coastal Management Program's enforceable policies.

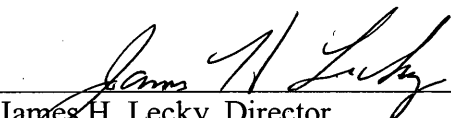
14) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

Response: 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. PGS' seismic survey will only use a moderate-sized seismic source (880 in<sup>3</sup> array) for a short period of time (approximately 75 days) in very shallow waters. This will create smaller ensonified areas than the zones created by many of the larger airgun arrays. Because of the small size of the safety radii of the exclusion zones, biological observers should be able to detect marine mammals and enforce necessary mitigation measures to reduce the impacts to bowhead whales and other marine mammal species. Night vision devices will be available on the seismic source vessels. Seismic operations will only be allowed to begin in poor visibility conditions if the entire monitoring area has been visible for at least 30 minutes prior to commencement of activities or unless the seismic source has maintained a sound source pressure level of at least 180 dB re 1  $\mu$ Pa rms during the interruption of seismic survey operations. In addition, from August 25 until the end of the bowhead hunt in Nuiqsut, PGS will operate solely inside the barrier islands where the sound is expected to be absorbed and to not propagate into the main migration corridor. In order to avoid, and if not possible, minimize, adverse effects, NMFS is requiring PGS to implement mitigation measures, such as monitoring exclusion zones to prevent injury; ramp-up; and power-down and shutdown procedures when marine mammals are observed just outside or inside the safety zones. These mitigation measures further reduce the potential for cumulative adverse effects. The survey would also not be expected to have a substantial cumulative effect on any fish or invertebrate species. Although some loss of fish and other marine life might occur as a result of being in close proximity to the seismic airguns, this loss is not expected to be significant. Additionally, 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. Due to the relatively large habitat area for marine mammals (and other marine species) in the Arctic Ocean and the small area of the Beaufort Sea that is of interest for conducting this seismic survey in 2008, the relatively short time that seismic operations will be in the area (mid-July to early-October), the dispersed nature of marine mammals (particularly pinnipeds), the relatively low density of all marine mammal species in this part of the Arctic, avoidance behavior by some species (bowheads and belugas) to the activity area, and the implementation of mitigation measures (e.g., black-out areas), NMFS does not anticipate that the proposed action will result in cumulative adverse effects that could have a substantial effect on marine mammals or other marine species.

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## DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting PEA, the 2008 SEA prepared for issuance of an IHA to PGS to take marine mammals incidental to conducting a 3D OBC seismic survey in the Beaufort Sea off Alaska in the summer of 2008, and other related documents, it is hereby determined that issuance of this IHA in accordance with selected alternative 6 will not significantly impact the quality of the human environment. 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 Environmental Impact Statement for this action is not necessary.

  
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James H. Lecky, Director  
Office of Protected Resources  
National Marine Fisheries Service

JUL 30 2008

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Date