Background

On March 13, 2015, the U.S. Environmental Protection Agency announced the availability of NMFS' DEIS concerning the Makah Indian Tribe's February 2005 request to resume limited hunting of ENP gray whales in the coastal portion of the Tribe's usual and accustomed fishing grounds, off the coast of Washington State, for ceremonial and subsistence purposes. Informed by information received during public scoping, this DEIS contains updates and a new set of alternatives compared to a previous DEIS released on May 9, 2008 (73 FR 26394) and later terminated on May 21, 2012 (77 FR 29967). The Tribe's proposed action stems from the 1855 Treaty of Neah Bay, which expressly secures the Makah Tribe's right to hunt whales. To exercise that right, the Tribe is seeking authorization from NMFS under the MMPA and the Whaling Convention Act. The release of this new DEIS is one of several steps NMFS will undertake to evaluate the Tribe's request.

The DEIS, prepared pursuant to the National Environmental Policy Act, considers various alternatives to the Tribe's proposed action. To develop the full range of action alternatives—five in total—we considered the principal components associated with a hunt, including: The time when whale hunting would occur; the area where whale hunting would occur; the annual and six-year limits on the number of whales harvested, struck, and struck and lost; cessation of whale hunting if a predetermined number of identified whales (*i.e.,* included in a photographic catalog of whales from the Pacific Coast Feeding Group area) were harvested; and the method of hunting. This DEIS addresses a number of resources identified for review during both internal and public scoping, including: Water quality, marine habitat and species, eastern and western North Pacific gray whales, other wildlife species, economics, environmental justice, social environment, cultural resources, ceremonial and subsistence resources, noise, aesthetics, transportation, public services, public safety, and human health.

The DEIS provides an important opportunity for the public to formally comment on the Tribe's proposal and the various alternatives. These comments, in conjunction with considerations described in the DEIS, will provide key information to assist NMFS with its final decision on the Tribe's request.

Access to Government Building

For access to the Federal government building in Seattle, Washington, the Department of Commerce Western Region Security Office has advised that all attendees must have valid government-issued identification (e.g., driver's license, tribal identification card, or passport). Prospective attendees for the public meeting in the NOAA Auditorium in Seattle, Washington should submit their first and last names and affiliation, if appropriate, via the NMFS email site (See **ADDRESSES**) by 4 p.m. PDT on April 26, 2015.

Reasonable Accommodation

Persons needing reasonable accommodations to attend and participate in the public meetings should contact Steve Stone (see **FOR FURTHER INFORMATION CONTACT**). To allow sufficient time to process requests, please call at least 5 business days prior to the relevant meeting(s).

Dated: March 17, 2015.

Perry F. Gayaldo,

Deputy Director, Office of Protected Resources, National Marine Fisheries Service.

[FR Doc. 2015–06432 Filed 3–19–15; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

Foreign-Trade Zones Board

[Order No. 1966]

Reorganization of Foreign-Trade Zone 186 Under Alternative Site Framework; Waterville, Maine

Pursuant to its authority under the Foreign-Trade Zones Act of June 18, 1934, as amended (19 U.S.C. 81a–81u), the Foreign-Trade Zones Board (the Board) adopts the following Order:

Whereas, the Board adopted the alternative site framework (ASF) (15 CFR Sec. 400.2(c)) as an option for the establishment or reorganization of zones;

Whereas, the City of Waterville, grantee of Foreign-Trade Zone 186, submitted an application to the Board (FTZ Docket B–65–2014, docketed 09–11–2014) for authority to reorganize under the ASF with a service area of the Counties of Lincoln, Cumberland, Sagadahoc, Androscoggin, Kennebec, Waldo, Knox and Somerset (partial), Maine, within and adjacent to the Belfast Customs and Border Protection port of entry, and FTZ 186's existing Site 1 would be categorized as a magnet site;

Whereas, notice inviting public comment was given in the **Federal Register** (79 FR 56057, 09–18–2014) and the application has been processed pursuant to the FTZ Act and the Board's regulations; and,

Whereas, the Board adopts the findings and recommendations of the examiner's report, and finds that the requirements of the FTZ Act and the Board's regulations are satisfied;

Now, therefore, the Board hereby orders:

The application to reorganize FTZ 186 under the ASF is approved, subject to the FTZ Act and the Board's regulations, including Section 400.13, and to the Board's standard 2,000-acre activation limit for the zone.

Signed at Washington, DC, this March 12, 2015.

Ronald K. Lorentzen,

Acting Assistant Secretary of Commerce for Enforcement and Compliance, Alternate Chairman, Foreign-Trade Zones Board.

Andrew McGilvray,

Executive Secretary.

[FR Doc. 2015–06462 Filed 3–19–15; 8:45 am]

BILLING CODE 3510–DS–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XD830

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Seismic Surveys in Cook Inlet, Alaska

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments.

SUMMARY: NMFS has received a request from SAExploration Inc. (SAE) for authorization to take marine mammals incidental to a proposed oil and gas exploration seismic survey program in Cook Inlet, Alaska between April 1, 2015 and December 31, 2015. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to SAE to incidentally take marine mammals, by Level B harassment only, during the specified activity.

DATES: Comments and information must be received no later than April 20, 2015.

ADDRESSES: Comments on the application should be addressed to Jolie Harrison, Supervisor, Incidental Take Program, Permits and Conservation

Division, Office of Protected Resources, National Marine Fisheries Service. Physical comments should be sent to 1315 East-West Highway, Silver Spring, MD 20910 and electronic comments should be sent to *itp.young@noaa.gov.*

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments received electronically, including all attachments, must not exceed a 25-megabyte file size. Attachments to electronic comments will be accepted in Microsoft Word or Excel or Adobe PDF file formats only. All comments received are a part of the public record and will generally be posted to the Internet at *www.nmfs.noaa.gov/pr/permits/incidental.htm* without change. All personal identifying information (*e.g.,* name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Sara Young, Office of Protected Resources, NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Availability

An electronic copy of the application and supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the Internet at: *www.nmfs.noaa.gov/pr/permits/incidental.htm.* In case of problems accessing these documents, please call the contact listed above (see **FOR FURTHER INFORMATION CONTACT**). The following associated documents are also available at the same internet address: *Application Packet, Marine Mammal Mitigation and Monitoring Plan, draft Environmental Assessment.*

We are also preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) and will consider comments submitted in response to this notice as part of that process. The EA will be posted at the NOAA Fisheries Incidental Take internet site once it is finalized.

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers 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 for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if 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.''

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].

Summary of Request

On October 28, 2014, we received a request from SAE for authorization to take marine mammals incidental to seismic surveys in Cook Inlet, Alaska. After further correspondence and revisions by the applicant, we determined that the application was adequate and complete on January 12, 2015.

SAE proposes to conduct oil and gas exploration seismic surveys. The proposed activity would occur between April 1, 2015 and December 31, 2015, for a period of 160 days. The following specific aspects of the proposed activities are likely to result in the take of marine mammals: Operation of seismic airguns in arrays of 440 in^3 and 1,760 in^3. Take, by Level B Harassment only, of individuals of beluga whale, harbor porpoise, killer whale, harbor seal, and Steller sea lion is anticipated to result from the specified activity.

Description of the Specified Activity

Overview

SAE plans to conduct 3D seismic surveys over multiple years in the marine waters of both upper and lower Cook Inlet. This proposed authorization will cover activities occurring between April 1, 2015 and March 31, 2016. The ultimate survey area is divided into two units (upper and lower Cook Inlet). The total potential survey area is 3,934 square kilometers (1,519 square miles); however, only a portion (currently unspecified) of this area will ultimately be surveyed, and no more than 777 square kilometers (300 square miles) in a given year. The exact location of where the 2015 survey will be conducted is not known at this time, and probably will not be known until spring 2015 when SAE's clients have finalized their data acquisition needs.

The components of the project include laying recording sensors (nodes) on the ocean floor, operating seismic source vessels towing active air gun arrays, and retrieval of nodes. There will also be additional boat activity associated with crew transfer, recording support, and additional monitoring for marine mammals. The primary seismic source for offshore recording consists of a 2 x 880-cubic-inch tri-cluster array for a total of 1,760-cubic-inches (although a 440-cubic-inch array may be used in very shallow water locations as necessary). Each of the arrays will be deployed in a configuration outlined in Appendix A of the application. The arrays will be centered approximately 15 meters (50 feet) behind the source vessel stern, at a depth of 4 meters (12 feet), and towed along predetermined source lines at speeds between 7.4 and 9.3 kilometers per hour (4 and 5 knots). Two vessels with full arrays will be operating simultaneously in an alternating shot mode; one vessel shooting while the other is recharging. Shot intervals are expected to be about 16 seconds for each array resulting in an overall shot interval of 8 seconds considering the two alternating arrays. Operations are expected to occur 24 hours a day, with actual daily shooting to total about 12 hours. An acoustical positioning (or pinger) system will be used to position and interpolate the location of the nodes. A vessel-mounted transceiver calculates the position of the nodes by measuring the range and bearing from the transceiver to a small acoustic transponder fitted to every third node. The transceiver uses sonar to interrogate the transponders, which respond with short pulses that are used in measuring the range and bearing. Several offshore vessels will be required to support recording, shooting, and housing in the marine and transition zone environments. Exact vessels to be used have not been determined.

Dates and Duration

The request for incidental harassment authorization is for the 2015 Cook Inlet open water season (April 1 to December 31). All associated activities, including mobilization, survey activities, and demobilization of survey and support crews, would occur between the above dates. The plan is to conduct seismic surveys in the Upper Cook unit sometime between April 1 and December 31. The northern border of the seismic survey area depicted in Figure 1 takes into account the restriction that no activity occur between April 15 to October 15 in waters within 16 kilometers (10 miles) of the Susitna Delta (defined as the nearshore area between the mouths of the Beluga and the Little Susitna rivers). A small wedge of the upper Cook unit falls within 16 kilometers of the Beluga River mouth, but survey here would occur after October 15, taking into account any timing restrictions with nearshore beluga habitat. The seismic acquisition in lower Cook unit would initially begin in late August or mid-September, and run until December 15 taking into account any self-imposed location/timing restrictions to avoid encounters with sea otters or Steller's eiders. The exact survey dates in a given unit will depend on ice conditions, timing restrictions, and other factors. If the upper Cook Inlet seismic surveys are delayed by spring ice conditions, some survey may occur in lower Cook Inlet from March to May to maximize use of the seismic fleet. Actual data acquisition is expected to occur for only 2 to 3 hours at a time during each of the 3 to 4 daily slack tides. Thus, it is expected that the air guns would operate an average of about 8 to 10 total hours per day. It is estimated that it will take 160 days to complete both the upper and lower Cook units, and that no more than 777 square kilometers (300 square miles) of survey area will be shot in 2015.

Specified Geographic Region

The area of Cook Inlet that SAE plans to operate in has been divided into two subsections: Upper and Lower Cook Inlet. Upper Cook (2,126 square kilometers; 821 square miles) begins at the line delineating Cook Inlet beluga whale (*Delphinapterus leucas*) Critical Habitat Area 1 and 2, south to a line approximately 10 kilometers (6 miles) south of both the West Foreland and East Foreland (Figure 1 in SAE application).

Lower Cook (1,808 square kilometer; 698 square mile) begins east of Kalgin Island and running along the east side of lower Cook Inlet to Anchor Point (Figure 2 in SAE application).

Detailed Description of Activities

Survey Design

Marine seismic operations will be based on a ''recording patch'' or similar approach. Patches are groups of six receiver lines and 32 source lines (Figure 3 in SAE application). Each receiver line has submersible marine sensor nodes tethered (with non-kinking, non-floating line) equidistant (50 meters; 165 feet) from each other along the length of the line. Each node is a multicomponent system containing three velocity sensors and a hydrophone (Figure 4 in SAE application). Each receiver line is approximately 8 kilometers (5 miles) in length, and are spaced approximately 402 meters (1,320 feet) apart. Each receiver patch is 19.4 square kilometers (7.5 square miles) in area. The receiver patch is oriented such that the receiver lines run parallel to the shoreline.

The 32 source lines, 12 kilometers (7.5 miles) long and spaced 502 meters (1,650 feet) apart, run perpendicular to the receiver lines (and perpendicular to the coast) and, where possible, will extend approximately 5 kilometers (3 miles) beyond the outside receiver lines and approximately 4 kilometers (2.5 miles) beyond each of the ends of the receiver lines. The outside dimensions of the maximum shot area during a patch shoot will be 12 kilometers by 16 kilometers (7.5 miles by 10 miles), with an area of 192 square kilometers (754 square miles). All shot areas will be wholly contained within the survey boxes depicted in Figures 1 and 2 of SAE's application. Shot intervals along each source line will be 50 meters (165 feet).

It may take a period of three three to five days to deploy, shoot, and record a single receiver patch. On average, approximately 49 square kilometers (18.75 square miles) of patch will be shot daily. During recording of one patch, nodes from the previously surveyed patch will be retrieved, recharged, and data downloaded prior to redeployment of the nodes to the next patch. As patches are recorded, receiver lines are moved side to side or end to end to the next patch location so that receiver lines have continuous coverage of the recording area. Autonomous recording nodes lack cables but will be tethered together using a thin rope for ease of retrieval. This non-floating, non-kinking rope will lay on the seabed surface, as will the nodes, and will have no effect on marine traffic. Primary vessel positioning will be achieved using GPS with the antenna attached to the air gun array. Pingers deployed from the node vessels will be used for positioning of nodes. The geometry/patch could be modified as operations progress to improve sampling and operational efficiency.

Acoustic Sources

Air guns are the acoustic sources of primary concern and will be deployed from the seismic vessels. However, there are other noise sources to be considered. These include the pingers and transponders associated with locating receiver nodes, as well as propeller noise from the vessel fleet.

Seismic Source Array

The primary seismic source for offshore recording consists of a 2 x 880-cubic-inch tri-cluster array for a total of 1,760-cubic-inches (although a 440-cubic-inch array may be used in very shallow water locations as necessary). Each of the arrays will be deployed in a configuration outlined in Appendix A. The arrays will be centered approximately 15 meters (50 feet) behind the source vessel stern, at a depth of 4 meters (12 feet), and towed along predetermined source lines at speeds between 7.4 and 9.3 kilometers per hour (4 and 5 knots). Two vessels with full arrays will be operating simultaneously in an alternating shot mode; one vessel shooting while the other is recharging. Shot intervals are expected to be about 16 seconds for each array resulting in an overall shot interval of 8 seconds considering the two alternating arrays. Operations are expected to occur 24 hours a day, with actual daily shooting to total about 12 hours.

Based on the manufacturer's specifications, the 1,760-cubic-inch array has a peak-peak estimated sound source of 254.55 dB (decibels) re 1 micropascals (μPa) @ 1 m (53.5 bar-m; Far-field Signature, Appendix A), with a root mean square (rms) sound source of 236.55 dB re 1 μPa. The manufacturer-provided source directivity plots for the three possible air gun arrays are shown in Appendix A of the application. They clearly indicate that the acoustical broadband energy is concentrated along the vertical axis (focused downward), while there is little energy focused horizontally. The spacing between air guns results in offset arrival timing of the sound energy. These delays ''smear'' the sound signature as offset energy waves partially cancel each other, which reduces the amplitude in the horizontal direction. Thus, marine mammals near the surface and horizontal to the air gun

arrays would receive sound levels considerably less than a marine mammal situated directly beneath the array, and likely at levels less than predicted by the acoustical spreading model.

Air gun arrays typically produce most noise energy in the 10- to 120-hertz range, with some energy extending to 1 kilohertz (kHz) (Richardson *et al.* 1995). This sound energy is within the hearing range of all of the marine mammal species present in Cook Inlet, although based on available audiograms, pinniped and, especially, odontocete hearing is expected to be less sensitive in this range than mysticete hearing (Au and Hastings 2008; Southall *et al* 2007). Richardson *et al.* (1995) found little evidence of pinnipeds and odontocetes reacting to seismic pulses, suggesting pinnipeds are tolerant to these types of noise and odontocetes have difficulty hearing the low frequency energy. It is assumed, however, that SAE's air gun pulses will be audible to local pinnipeds and odontocetes given the high energy involved, but would more likely elicit reaction from baleen whales, such as minke and humpback whales, than the high frequency species.

Transceivers and Transponders

An acoustical positioning (or pinger) system will be used to position and interpolate the location of the nodes. A vessel-mounted transceiver calculates the position of the nodes by measuring the range and bearing from the transceiver to a small acoustic transponder fitted to every third node. The transceiver uses sonar to interrogate the transponders, which respond with short pulses that are used in measuring the range and bearing. The system provides a precise location of every node as needed for accurate interpretation of the seismic data. The transceiver to be used is the Sonardyne Scout USBL, while transponders will be the Sonardyne TZ/OBC Type 7815–000–06. Because the transceiver and transponder communicate via sonar, they produce underwater sound levels. The Scout USBL transceiver has a transmission source level of 197 dB re 1 µPa @ 1 m (rms) and operates at frequencies between 35 and 55 kHz. The transponder produces short pulses of 184 to 187 dB re 1 µPa (rms) @ 1 m at frequencies also between 35 and 55 kHz.

Both transceivers and transponders produce noise levels just above or within the most sensitive hearing range of seals (75 Hz to 100 kHz; (Hemilä *et al.* 2006; Kastelein *et al.* 2009; Reichmuth *et al.* 2013) and odontocetes (150 Hz to 180 kHz; Wartzok and Ketten 1999), and the functional hearing range of baleen whales (7 Hz to 30 kHz; Southall *et al* 2007). However, given the low acoustical output, the range where acoustic-based harassment to marine mammals (for the 197 dB transceiver) could occur extends about 100 meters (328 feet), or significantly less than the output from the air gun arrays, and is not loud enough to reach injury levels in marine mammals beyond 9 meters (30 feet). Marine mammals are likely to respond to pinger systems similar to air gun pulses, but only when very close (a few meters) to the sources.

Vessels

SAE will be using a variety of vessels to conduct the seismic survey and related activities. These include: Two source vessels, three node equipment deployment and retrieval vessels, one mitigation and housing vessel, one crew transport vessel, and two bow pickers.

Description of Marine Mammals in the Area of the Specified Activity

Marine mammals most likely to be found in the upper Cook activity area are the beluga whale (*Delphinapterus leucas*), harbor porpoise (*Phocoena phocoena*), and harbor seal (*Phoca vitulina*). However, these species are found there in low numbers, and generally only during the summer fish runs (Nemeth *et al.* 2007, Boveng *et al.* 2012). These species are also found in the Lower Cook survey area along with humpback whales (*Megaptera novaeangliae*), minke whales (*Balaenoptera acutorostra*), gray whales (*Eschrichtius robustus*), killer whales (*Orcinus orca*), Dall's porpoise (*Phocoenoides dalli*), and Steller sea lions (*Eumetopia jubatus*). Minke whales have been considered migratory in Alaska (Allen and Angliss, 2014) but have recently been observed off Cape Starichkof and Anchor Point year-round (Owl Ridge, 2014). Humpback and gray whales are seasonal in Lower Cook, while the remaining species could be encountered at any time of the year. During marine mammal monitoring conducted off Cape Starichkof between May and August 2013, observers recorded small numbers of humpback whales, minke whales, gray whales, killer whales, and Steller sea lions, and moderate numbers of harbor porpoises and harbor seals (Owl Ridge, 2014). This survey also recorded a single beluga observed 6 kilometers north of Cape Starichkof in August 2013. The stock sizes for marine mammals found in the proposed project area in Cook Inlet are shown in Table 1.

TABLE 1—MARINE MAMMALS INHABITING THE COOK INLET ACTION AREA

Species	Stock	ESA/MMPA status [1]; Strategic (Y/N)	Stock abundance (CV, N_{min}, most recent abundance survey) [2]	Relative occurrence in Cook Inlet; season of occurrence
Humpback whale	Central North Pacific	E/D;Y	7,469 (0.095;5,833;2000)	Occasionally seen in Lower Inlet, summer.
Minke whale	Alaska	—;N	1,233 (0.034;N/A;2003)	Infrequently occur but reported year-round.
Gray whale	Eastern North Pacific	—; N	19,126 (0.071; 18,017; 2007).	Rare migratory visitor; late winter.
Killer whale	Alaska Resident	—;N	2,347 (N/A; 2,084; 2009)	Occasionally sighted in Lower Cook Inlet.
	Alaska Transient	—:N	345 (N/A; 303; 2003).	
Beluga whale	Cook Inlet	E/D;Y	312 (0.10; 280; 2012)	Use upper Inlet in summer and lower in winter: annual.
Harbor porpoise	Gulf of Alaska	—;Y	31,046 (0.214; 25,987; 1998).	Widespread in the Inlet: annual (less in winter).
Dall's porpoise	Alaska			Infrequently found in Lower Inlet.
Steller sea lion	Western DPS	E/D;Y	79,300 (N/A; 45,659; 2012).	Primarily found in lower Inlet.

TABLE 1—MARINE MAMMALS INHABITING THE COOK INLET ACTION AREA—Continued

Species	Stock	ESA/MMPA status [1]; Strategic (Y/N)	Stock abundance (CV, N_{min}, most recent abundance survey) [2]	Relative occurrence in Cook Inlet; season of occurrence
Harbor seal	Cook Inlet/Shelikof	—;N	22,900 (0.053; 21,896; 2006).	Frequently found in upper and lower inlet; annual (more in northern Inlet in summer).

Source: Allen and Angliss (20142, 2013), Carretta *et al.* (2013), Zerbini *et al.* (2006).

Humpback Whale (Megaptera novaeangliae)

Although there is considerable distributional overlap in the humpback whale stocks that use Alaska, the whales seasonally found in lower Cook Inlet are probably of the Central North Pacific stock. Listed as endangered under the Endangered Species Act (ESA), this stock has recently been estimated at 7,469, with the portion of the stock that feeds in the Gulf of Alaska estimated at 2,845 animals (Allen and Angliss 20143). The Central North Pacific stock winters in Hawaii and summers from British Columbia to the Aleutian Islands (Calambokidis *et al.* 1997), including Cook Inlet.

Humpback use of Cook Inlet is largely confined to lower Cook Inlet. They have been regularly seen near Kachemak Bay during the summer months (Rugh *et al.* 2005a), and there is a whale-watching venture in Homer capitalizing on this seasonal event. There are anecdotal observations of humpback whales as far north as Anchor Point, with recent summer observations extending to Cape Starichkof (Owl Ridge 2014). Humpbacks might be encountered in the vicinity of Anchor Point if seismic operations were to occur off the point during the summer. However, SAE plans, for the most part, to limit seismic activity along the Kenai Peninsula to during the spring and fall.

Minke Whale (Balaenoptera acutorostra)

Minke whales are the smallest of the rorqual group of baleen whales reaching lengths of up to 35 feet. They are also the most common of the baleen whales, although there are no population estimates for the North Pacific, although estimates have been made for some portions of Alaska. Zerbini *et al.* (2006) estimated the coastal population between Kenai Fjords and the Aleutian Islands at 1,233 animals.

During Cook Inlet-wide aerial surveys conducted from 1993 to 2004, minke whales were encountered only twice (1998, 1999), both times off Anchor Point 16 miles northwest of Homer. A minke whale was also reported off Cape Starichkof in 2011 (A. Holmes, pers. comm.) and 2013 (E. Fernandez and C. Hesselbach, pers. comm.), suggesting this location is regularly used by minke whales, including during the winter. Recently, several minke whales were recorded off Cape Starichkof in early summer 2013 during exploratory drilling conducted there (Owl Ridge 2014). There are no records north of Cape Starichkof, and this species is unlikely to be seen in upper Cook Inlet. There is a chance of encountering this whale during seismic operations along the Kenai Peninsula in lower Cook Inlet.

Gray Whale (Eschrichtius robustus)

Each spring, the Eastern North Pacific stock of gray whale migrates 8,000 kilometers (5,000 miles) northward from breeding lagoons in Baja California to feeding grounds in the Bering and Chukchi seas, reversing their travel again in the fall (Rice and Wolman 1971). Their migration route is for the most part coastal until they reach the feeding grounds. A small portion of whales do not annually complete the full circuit, as small numbers can be found in the summer feeding along the Oregon, Washington, British Columbia, and Alaskan coasts (Rice *et al.* 1984, Moore *et al.* 2007).

Human exploitation reduced this stock to an estimated ''few thousand'' animals (Jones and Schwartz 2002). However, by the late 1980s, the stock was appearing to reach carrying capacity and estimated to be at 26,600 animals (Jones and Schwartz 2002). By 2002, that stock had been reduced to about 16,000 animals, especially following unusually high mortality events in 1999 and 2000 (Allen and Angliss 2014). The stock has continued to grow since then and is currently estimated at 19,126 animals with a minimum estimate of 18,017 (Carretta *et al.* 2013).

Most gray whales migrate past the mouth of Cook Inlet to and from northern feeding grounds. However, small numbers of summering gray whales have been noted by fisherman near Kachemak Bay and north of Anchor Point. Further, summering gray whales were seen offshore of Cape Starichkof by marine mammal observers monitoring Buccaneer's Cosmopolitan drilling program in 2013 (Owl Ridge 2014). Regardless, gray whales are not expected to be encountered in upper Cook Inlet, where there are no records, but might be encountered during seismic operations along the Kenai Peninsula south of Ninilchik. However, seismic surveys are not planned in this region during the summer months when gray whales would be most expected.

Beluga Whale (Delphinapterus leucas)

The Cook Inlet beluga whale Distinct Population Segment (DPS) is a small geographically isolated population that is separated from other beluga populations by the Alaska Peninsula. The population is genetically (mtDNA) distinct from other Alaska populations suggesting the Peninsula is an effective barrier to genetic exchange (O'Corry-Crowe *et al.* 1997) and that these whales may have been separated from other stocks at least since the last ice age. Laidre *et al.* (2000) examined data from more than 20 marine mammal surveys conducted in the northern Gulf of Alaska and found that sightings of belugas outside Cook Inlet were exceedingly rare, and these were composed of a few stragglers from the Cook Inlet DPS observed at Kodiak Island, Prince William Sound, and Yakutat Bay. Several marine mammal surveys specific to Cook Inlet (Laidre *et al.* 2000, Speckman and Piatt 2000), including those that concentrated on beluga whales (Rugh *et al.* 2000, 2005a), clearly indicate that this stock largely confines itself to Cook Inlet. There is no indication that these whales make forays into the Bering Sea where they might intermix with other Alaskan stocks.

The Cook Inlet beluga DPS was originally estimated at 1,300 whales in 1979 (Calkins 1989) and has been the focus of management concerns since experiencing a dramatic decline in the 1990s. Between 1994 and 1998 the stock declined 47 percent which was attributed to overharvesting by subsistence hunting. Subsistence hunting was estimated to annually

remove 10 to 15 percent of the population during this period. Only five belugas have been harvested since 1999, yet the population has continued to decline, with the most recent estimate at only 312 animals (Allen and Angliss 2014). NMFS listed the population as ''depleted'' in 2000 as a consequence of the decline, and as ''endangered'' under the Endangered Species Act (ESA) in 2008 when the population failed to recover following a moratorium on subsistence harvest. In April 2011, NMFS designated critical habitat for the beluga under the ESA (Figure 3).

Prior to the decline, this DPS was believed to range throughout Cook Inlet and occasionally into Prince William Sound and Yakutat (Nemeth *et al.* 2007). However the range has contracted coincident with the population reduction (Speckman and Piatt 2000). During the summer and fall beluga whales are concentrated near the Susitna River mouth, Knik Arm, Turnagain Arm, and Chickaloon Bay (Nemeth *et al.* 2007) where they feed on migrating eulachon (*Thaleichthys pacificus*) and salmon (*Onchorhyncus spp.*) (Moore *et al.* 2000). Critical Habitat Area 1 reflects this summer distribution (Figure 3). During the winter, beluga whales concentrate in deeper waters in the mid-inlet to Kalgin Island, and in the shallow waters along the west shore of Cook Inlet to Kamishak Bay (Critical Habitat Area 2; Figure 1). Some whales may also winter in and near Kachemak Bay.

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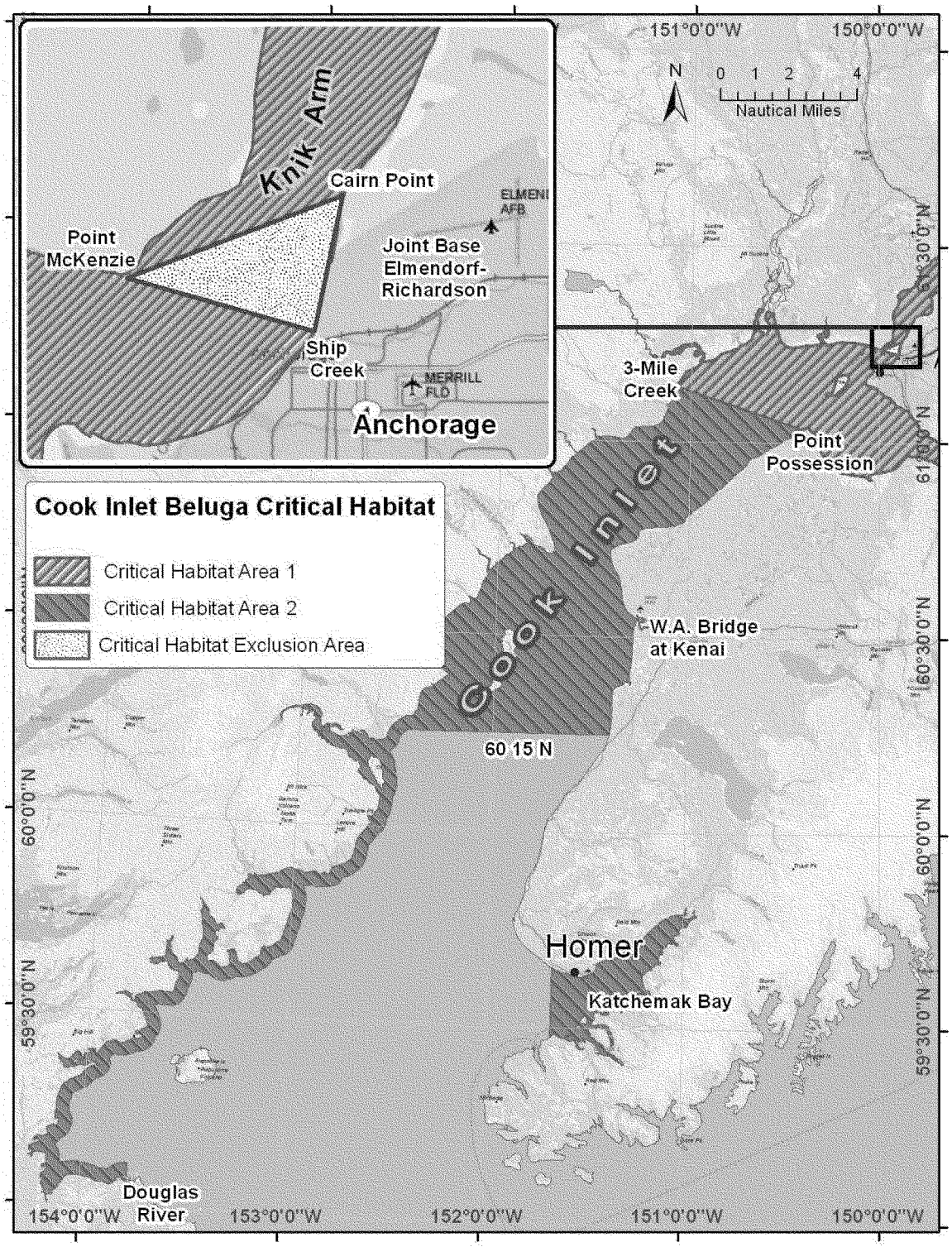

Figure 1. Cook Inlet Beluga Critical Habitat.

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Harbor Porpoise (Phocoena phocoena)

Harbor porpoise are small (1.5 meters length), relatively inconspicuous toothed whales. The Gulf of Alaska Stock is distributed from Cape Suckling to Unimak Pass and was most recently estimated at 31,046 animals (Allen and Angliss 2014). They are found primarily in coastal waters less than 100 meters (100 meters) deep (Hobbs and Waite 2010) where they feed on Pacific herring (*Clupea pallasii*), other schooling fishes, and cephalopods.

Although they have been frequently observed during aerial surveys in Cook Inlet, most sightings are of single animals, and are concentrated at Chinitna and Tuxedni bays on the west

side of lower Cook Inlet (Rugh *et al.* 2005a). Dahlheim *et al.* (2000) estimated the 1991 Cook Inlet-wide population at only 136 animals. However, they are one of the three marine mammals (besides belugas and harbor seals) regularly seen in upper Cook Inlet (Nemeth *et al.* 2007), especially during spring eulachon and summer salmon runs. Because harbor porpoise have been observed throughout Cook Inlet during the summer months, including mid-inlet waters, they could be encountered during seismic operations in upper Cook Inlet.

Dall's Porpoise (Phocoenoides dalli)

Dall's porpoise are widely distributed throughout the North Pacific Ocean including Alaska, although they are not found in upper Cook Inlet and the shallower waters of the Bering, Chukchi, and Beaufort Seas (Allen and Angliss 2014). Compared to harbor porpoise, Dall's porpoise prefer the deep offshore and shelf slope waters. The Alaskan population has been estimated at 83,400 animals (Allen and Angliss 2014), making it one of the more common cetaceans in the state. Dall's porpoise have been observed in lower Cook Inlet, including Kachemak Bay and near Anchor Point (Owl Ridge 2014), but sightings there are rare. There is a remote chance that Dall's porpoise might be encountered during seismic operations along the Kenai Peninsula.

Killer Whale (Orcinus orca)

Two different stocks of killer whales inhabit the Cook Inlet region of Alaska: the Alaska Resident Stock and the Gulf of Alaska, Aleutian Islands, Bering Sea Transient Stock (Allen and Angliss 2014). The resident stock is estimated at 2,347 animals and occurs from Southeast Alaska to the Bering Sea (Allen and Angliss 2014). Resident whales feed exclusively on fish and are genetically distinct from transient whales (Saulitis *et al.* 2000). The transient whales feed primarily on marine mammals (Saulitis *et al.* 2000). The transient population inhabiting the Gulf of Alaska shares mitochondrial DNA haplotypes with whales found along the Aleutian Islands and the Bering Sea suggesting a common stock, although there appears to be some subpopulation genetic structuring occurring to suggest the gene flow between groups is limited (see Allen and Angliss 2014). For the three regions combined, the transient population has been estimated at 587 animals (Allen and Angliss 2014).

Killer whales are occasionally observed in lower Cook Inlet, especially near Homer and Port Graham (Shelden *et al.* 2003, Rugh *et al.* 2005a). A concentration of sightings near Homer and inside Kachemak Bay may represent high use or may reflect high observer-effort, given most records are from a whale-watching venture based in Homer. The few whales that have been photographically identified in lower Cook Inlet belong to resident groups more commonly found in nearby Kenai Fjords and Prince William Sound (Shelden *et al.* 2003). Prior to the 1980s, killer whale sightings in upper Cook Inlet were very rare. During aerial surveys conducted between 1993 and 2004, killer whales were observed on only three flights, all in the Kachemak and English Bay area (Rugh *et al.* 2005a). However, anecdotal reports of killer whales feeding on belugas in upper Cook Inlet began increasing in the 1990s, possibly in response to declines in sea lion and harbor seal prey elsewhere (Shelden *et al.* 2003). These sporadic ventures of transient whales into beluga summering grounds have been implicated as a possible contributor to decline of Cook Inlet belugas in the 1990s, although the number of confirmed mortalities from killer whales is small (Shelden *et al.* 2003). If killer whales were to venture into upper Cook Inlet in 2015, they might be encountered during both seismic operations in both upper and lower Cook Inlet.

Steller Sea Lion (Eumetopia jubatus)

The Western Stock of the Steller sea lion is defined as all populations west of longitude 144°W to the western end of the Aleutian Islands. The most recent estimate for this stock is 45,649 animals (Allen and Angliss 2014), considerably less than that estimated 140,000 animals in the 1950s (Merrick *et al.* 1987). Because of this dramatic decline, the stock was listed as threatened under ESA in 1990, and was relisted as endangered in 1997. Critical habitat was designated in 1993, and is defined as a 20-nautical-mile radius around all major rookeries and haulout sites. The 20-nautical-mile buffer was established based on telemetry data that indicated these sea lions concentrated their summer foraging effort within this distance of rookeries and haul outs.

Steller sea lions inhabit lower Cook Inlet, especially in the vicinity of Shaw Island and Elizabeth Island (Nagahut Rocks) haulout sites (Rugh *et al.* 2005a), but are rarely seen in upper Cook Inlet (Nemeth *et al.* 2007). Of the 42 Steller sea lion groups recorded during Cook Inlet aerial surveys between 1993 and 2004, none were recorded north of Anchor Point and only one in the vicinity of Kachemak Bay (Rugh *et al.* 2005a). Marine mammal observers associated with Buccaneer's drilling project off Cape Starichkof did observe seven Steller sea lions during the summer of 2013 (Owl Ridge 2014).

The upper reaches of Cook Inlet may not provide adequate foraging conditions for sea lions for establishing a major haul out presence. Steller sea lions feed largely on walleye pollock (*Theragra chalcogramma*), salmon (*Onchorhyncus spp.*), and arrowtooth flounder (*Atheresthes stomias*) during the summer, and walleye pollock and Pacific cod (*Gadus macrocephalus*) during the winter (Sinclair and Zeppelin 2002), none which, except for salmon, are found in abundance in upper Cook Inlet (Nemeth *et al.* 2007). Steller sea lions are unlikely to be encountered during seismic operations in upper Cook Inlet, but they could possibly be encountered along the Kenai Peninsula, especially closer to Anchor Point.

Harbor Seal (Phoca vitulina)

With more than 150,000 animals state-wide (Allen and Angliss 2014), harbor seals are one of the more common marine mammal species in Alaskan waters. They are most commonly seen hauled out at tidal flats and rocky areas. Harbor seals feed largely on schooling fish such a walleye pollock, Pacific cod, salmon, Pacific herring, eulachon, and squid. Although harbor seals may make seasonal movements in response to prey, they are resident to Alaska and do not migrate.

The Cook Inlet/Shelikof Stock, ranging from approximately Anchorage down along the south side of the Alaska Peninsula to Unimak Pass, has been recently estimated at a stable 22,900 (Allen and Angliss 2014). Large numbers concentrate at the river mouths and embayments of lower Cook Inlet, including the Fox River mouth in Kachemak Bay (Rugh *et al.* 2005a). Montgomery *et al.* (2007) recorded over 200 haulout sites in lower Cook Inlet alone. However, only a few dozens to a couple hundred seals seasonally occur in upper Cook Inlet (Rugh *et al.* 2005a), mostly at the mouth of the Susitna River where their numbers vary in concert with the spring eulachon and summer salmon runs (Nemeth *et al.* 2007, Boveng *et al.* 2012). In 2012, up to 100 harbor seals were observed hauled out at the mouths of the Theodore and Lewis rivers during monitoring activity associated with SAE's (with Apache) 2012 Cook Inlet seismic program. Montgomery *et al.* (2007) also found seals elsewhere in Cook Inlet to move in response to local steelhead (Onchorhynchus mykiss) and salmon

runs. Harbor seals may be encountered during seismic operations in both upper and lower Cook Inlet.

Potential Effects of the Specified Activity on Marine Mammals

This section includes a summary and discussion of the ways that components (*e.g.,* seismic airgun operations, vessel movement) of the specified activity, including mitigation, may impact marine mammals. The ''Estimated Take by Incidental Harassment'' section later in this document will include a quantitative analysis of the number of individuals that are expected to be taken by this activity. The ''Negligible Impact Analysis'' section will include the analysis of how this specific activity will impact marine mammals and will consider the content of this section, the ''Estimated Take by Incidental Harassment'' section, the ''Proposed Mitigation'' section, and the ''Anticipated Effects on Marine Mammal Habitat'' section to draw conclusions regarding the likely impacts of this activity on the reproductive success or survivorship of individuals and from that on the affected marine mammal populations or stocks.

Operating active acoustic sources, such as airgun arrays, has the potential for adverse effects on marine mammals. The majority of anticipated impacts would be from the use of acoustic sources.

Acoustic Impacts

When considering the influence of various kinds of sound on the marine environment, it is necessary to understand that different kinds of marine life are sensitive to different frequencies of sound. Based on available behavioral data, audiograms have been derived using auditory evoked potentials, anatomical modeling, and other data. Southall *et al.* (2007) designated ''functional hearing groups'' for marine mammals and estimate the lower and upper frequencies of functional hearing of the groups. The functional groups and the associated frequencies are indicated below (note that animals are less sensitive to sounds at the outer edge of their functional range and most sensitive to sounds of frequencies within a smaller range somewhere in the middle of their functional hearing range) and have been modified slightly from Southall *et al.* 2007 to incorporate some newer information:

- Low frequency cetaceans (13 species of mysticetes): functional hearing is estimated to occur between approximately 7 Hz and 30 kHz; (Ketten and Mountain 2009; Tubelli *et al.* 2012)
- Mid-frequency cetaceans (32 species of dolphins, six species of larger toothed whales, and 19 species of beaked and bottlenose whales): functional hearing is estimated to occur between approximately 150 Hz and 160 kHz; (Southall *et al.* 2007)
- High frequency cetaceans (eight species of true porpoises, six species of river dolphins, Kogia, the franciscana, and four species of cephalorhynchids): functional hearing is estimated to occur between approximately 200 Hz and 180 kHz; (Southall *et al.* 2007)
- Phocid pinnipeds in Water: functional hearing is estimated to occur between approximately 75 Hz and 100 kHz; (Hemilä *et al.* 2006; Mulsow *et al.* 2011; Reichmuth *et al.* 2013) and
- Otariid pinnipeds in Water: Functional hearing is estimated to occur between approximately 100 Hz and 40 kHz. (Reichmuth *et al.* 2013)

As mentioned previously in this document, nine marine mammal species (seven cetacean and two pinniped species) are likely to occur in the proposed seismic survey area. Of the seven cetacean species likely to occur in SAE's proposed project area, three classified as a low-frequency cetaceans (humpback, minke, gray whale), two are classified as mid-frequency cetaceans (beluga and killer whales), and two are classified as a high-frequency cetaceans (Dall's and harbor porpoise) (Southall *et al.,* 2007). Of the two pinniped species likely to occur in SAE's proposed project area, one is classified as a phocid (harbor seal), and one is classified as an otariid (Steller sea lion). A species' functional hearing group is a consideration when we analyze the effects of exposure to sound on marine mammals.

1. Potential Effects of Airgun Sounds on Marine Mammals

The effects of sounds from airgun pulses might include one or more of the following: tolerance, masking of natural sounds, behavioral disturbance, and temporary or permanent hearing impairment or non-auditory effects (Richardson *et al.,* 1995). As outlined in previous NMFS documents, the effects of noise on marine mammals are highly variable, often depending on species and contextual factors (based on Richardson *et al.,* 1995).

Tolerance: Numerous studies have shown that pulsed sounds from air guns are often readily detectable in the water at distances of many kilometers. Numerous studies have also shown that marine mammals at distances more than a few kilometers from operating survey vessels often show no apparent response. That is often true even in cases when the pulsed sounds must be readily audible to the animals based on measured received levels and the hearing sensitivity of that mammal group. In general, pinnipeds and small odontocetes (toothed whales) seem to be more tolerant of exposure to air gun pulses than baleen whales. Although various toothed whales, and (less frequently) pinnipeds have been shown to react behaviorally to airgun pulses under some conditions, at other times, mammals of both types have shown no overt reactions. Weir (2008) observed marine mammal responses to seismic pulses from a 24 airgun array firing a total volume of either 5,085 in^3 or 3,147 in^3 in Angolan waters between August 2004 and May 2005. Weir recorded a total of 207 sightings of humpback whales (n = 66), sperm whales (n = 124), and Atlantic spotted dolphins (n = 17) and reported that there were no significant differences in encounter rates (sightings/hr) for humpback and sperm whales according to the airgun array's operational status (*i.e.,* active versus silent).

Behavioral Disturbance: Marine mammals may behaviorally react to sound when exposed to anthropogenic noise. These behavioral reactions are often shown as: Changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where noise sources are located; and/or flight responses (*e.g.,* pinnipeds flushing into water from haulouts or rookeries).

The biological significance of many of these behavioral disturbances is difficult to predict. The consequences of behavioral modification to individual fitness can range from none up to potential changes to growth, survival, or reproduction, depending on the context, duration, and degree of behavioral modification. Examples of behavioral modifications that could impact growth, survival or reproduction include: Drastic changes in diving/surfacing/swimming patterns that lead to stranding (such as those associated with beaked whale strandings related to exposure to military mid-frequency tactical sonar); longer-term abandonment of habitat that is specifically important for feeding, reproduction, or other critical needs, or significant disruption of feeding or social interaction resulting in substantive energetic costs, inhibited

breeding, or prolonged or permanent cow-calf separation.

The onset of behavioral disturbance from anthropogenic noise depends on both external factors (characteristics of noise sources and their paths) and the receiving animals (hearing, motivation, experience, demography) and is also difficult to predict (Southall *et al.,* 2007).

Toothed whales. Few systematic data are available describing reactions of toothed whales to noise pulses. However, systematic work on sperm whales (Tyack *et al.,* 2003) has yielded an increasing amount of information about responses of various odontocetes to seismic surveys based on monitoring studies (*e.g.,* Stone, 2003; Smultea *et al.,* 2004; Moulton and Miller, 2005).

Seismic operators and marine mammal observers sometimes see dolphins and other small toothed whales near operating airgun arrays, but, in general, there seems to be a tendency for most delphinids to show some limited avoidance of seismic vessels operating large airgun systems. However, some dolphins seem to be attracted to the seismic vessel and floats, and some ride the bow wave of the seismic vessel even when large arrays of airguns are firing. Nonetheless, there have been indications that small toothed whales sometimes move away or maintain a somewhat greater distance from the vessel when a large array of airguns is operating than when it is silent (*e.g.,* Gold, 1996a,b,c; Calambokidis and Osmek, 1998; Stone, 2003). The beluga may be a species that (at least in certain geographic areas) shows long-distance avoidance of seismic vessels. Aerial surveys during seismic operations in the southeastern Beaufort Sea recorded much lower sighting rates of beluga whales within 10–20 km (6.2–12.4 mi) of an active seismic vessel. These results were consistent with the low number of beluga sightings reported by observers aboard the seismic vessel, suggesting that some belugas might have been avoiding the seismic operations at distances of 10–20 km (6.2–12.4 mi) (Miller *et al.,* 2005).

Captive bottlenose dolphins and (of more relevance in this project) beluga whales exhibit changes in behavior when exposed to strong pulsed sounds similar in duration to those typically used in seismic surveys (Finneran *et al.,* 2002, 2005). However, the animals tolerated high received levels of sound (pk–pk level >200 dB re 1 μPa) before exhibiting aversive behaviors.

Observers stationed on seismic vessels operating off the United Kingdom from 1997—2000 have provided data on the occurrence and behavior of various toothed whales exposed to seismic pulses (Stone, 2003; Gordon *et al.,* 2004). Killer whales were found to be significantly farther from large airgun arrays during periods of shooting compared with periods of no shooting. The displacement of the median distance from the array was approximately 0.5 km (0.3 mi) or more. Killer whales also appear to be more tolerant of seismic shooting in deeper water.

Reactions of toothed whales to large arrays of airguns are variable and, at least for delphinids, seem to be confined to a smaller radius than has been observed for mysticetes. However, based on the limited existing evidence, belugas should not necessarily generally be grouped with delphinids in the ''less responsive'' category.

Pinnipeds. Pinnipeds are not likely to show a strong avoidance reaction to the airgun sources proposed for use. Visual monitoring from seismic vessels has shown only slight (if any) avoidance of airguns by pinnipeds and only slight (if any) changes in behavior. Monitoring work in the Alaskan Beaufort Sea during 1996–2001 provided considerable information regarding the behavior of Arctic ice seals exposed to seismic pulses (Harris *et al.,* 2001; Moulton and Lawson, 2002). These seismic projects usually involved arrays of 6 to 16 airguns with total volumes of 560 to 1,500 in^3. The combined results suggest that some seals avoid the immediate area around seismic vessels. In most survey years, ringed seal sightings tended to be farther away from the seismic vessel when the airguns were operating than when they were not (Moulton and Lawson, 2002). However, these avoidance movements were relatively small, on the order of 100 m (328 ft) to a few hundreds of meters, and many seals remained within 100–200 m (328–656 ft) of the trackline as the operating airgun array passed by. Seal sighting rates at the water surface were lower during airgun array operations than during no-airgun periods in each survey year except 1997. Similarly, seals are often very tolerant of pulsed sounds from seal-scaring devices (Mate and Harvey, 1987; Jefferson and Curry, 1994; Richardson *et al.,* 1995a). However, initial telemetry work suggests that avoidance and other behavioral reactions by two other species of seals, grey and harbor seals, to small airgun sources may at times be stronger than evident to date from visual studies of pinniped reactions to airguns (Thompson *et al.,* 1998). Even if reactions of the species occurring in the activity area are as strong as those evident in the telemetry study, reactions are expected to be confined to relatively small distances and durations, with no long-term effects on pinniped individuals or populations.

Masking: Masking is the obscuring of sounds of interest by other sounds, often at similar frequencies. Marine mammals use acoustic signals for a variety of purposes, which differ among species, but include communication between individuals, navigation, foraging, reproduction, avoiding predators, and learning about their environment (Erbe and Farmer, 2000; Tyack, 2000). Masking, or auditory interference, generally occurs when sounds in the environment are louder than, and of a similar frequency to, auditory signals an animal is trying to receive. Masking is a phenomenon that affects animals trying to receive acoustic information about their environment, including sounds from other members of their species, predators, prey, and sounds that allow them to orient in their environment. Masking these acoustic signals can disturb the behavior of individual animals, groups of animals, or entire populations.

Masking occurs when anthropogenic sounds and signals (that the animal utilizes) overlap at both spectral and temporal scales. For the airgun sound generated from the proposed seismic surveys, sound will consist of low frequency (under 500 Hz) pulses with extremely short durations (less than one second). Lower frequency man-made sounds are more likely to affect detection of communication calls and other potentially important natural sounds such as surf and prey noise. There is little concern regarding masking near the sound source due to the brief duration of these pulses and relatively longer silence between air gun shots (approximately 12 seconds). However, at long distances (over tens of kilometers away), due to multipath propagation and reverberation, the durations of airgun pulses can be ''stretched'' to seconds with long decays (Madsen *et al.,* 2006), although the intensity of the sound is greatly reduced.

This could affect communication signals used by low frequency mysticetes when they occur near the noise band and thus reduce the communication space of animals (*e.g.,* Clark *et al.,* 2009) and cause increased stress levels (*e.g.,* Foote *et al.,* 2004; Holt *et al.,* 2009); however, no baleen whales are expected to occur within the proposed action area. Marine mammals are thought to be able to compensate for masking by adjusting their acoustic behavior by shifting call frequencies,

and/or increasing call volume and vocalization rates. For example, blue whales were found to increase call rates when exposed to seismic survey noise in the St. Lawrence Estuary (Di Iorio and Clark, 2010). The North Atlantic right whales (*Eubalaena glacialis*) exposed to high shipping noise increase call frequency (Parks *et al.,* 2007), while some humpback whales respond to low-frequency active sonar playbacks by increasing song length (Miller *et al.,* 2000). Additionally, beluga whales have been known to change their vocalizations in the presence of high background noise possibly to avoid masking calls (Au *et al.,* 1985; Lesage *et al.,* 1999; Scheifele *et al.,* 2005). Although some degree of masking is inevitable when high levels of manmade broadband sounds are introduced into the sea, marine mammals have evolved systems and behavior that function to reduce the impacts of masking. Structured signals, such as the echolocation click sequences of small toothed whales, may be readily detected even in the presence of strong background noise because their frequency content and temporal features usually differ strongly from those of the background noise (Au and Moore, 1988, 1990). The components of background noise that are similar in frequency to the sound signal in question primarily determine the degree of masking of that signal.

Redundancy and context can also facilitate detection of weak signals. These phenomena may help marine mammals detect weak sounds in the presence of natural or manmade noise. Most masking studies in marine mammals present the test signal and the masking noise from the same direction. The sound localization abilities of marine mammals suggest that, if signal and noise come from different directions, masking would not be as severe as the usual types of masking studies might suggest (Richardson *et al.,* 1995). The dominant background noise may be highly directional if it comes from a particular anthropogenic source such as a ship or industrial site. Directional hearing may significantly reduce the masking effects of these sounds by improving the effective signal-to-noise ratio. In the cases of higher frequency hearing by the bottlenose dolphin, beluga whale, and killer whale, empirical evidence confirms that masking depends strongly on the relative directions of arrival of sound signals and the masking noise (Penner *et al.,* 1986; Dubrovskiy, 1990; Bain *et al.,* 1993; Bain and Dahlheim, 1994). Toothed whales and probably other marine mammals as well, have additional capabilities besides directional hearing that can facilitate detection of sounds in the presence of background noise. There is evidence that some toothed whales can shift the dominant frequencies of their echolocation signals from a frequency range with a lot of ambient noise toward frequencies with less noise (Au *et al.,* 1974, 1985; Moore and Pawloski, 1990; Thomas and Turl, 1990; Romanenko and Kitain, 1992; Lesage *et al.,* 1999). A few marine mammal species are known to increase the source levels or alter the frequency of their calls in the presence of elevated sound levels (Dahlheim, 1987; Au, 1993; Lesage *et al.,* 1993, 1999; Terhune, 1999; Foote *et al.,* 2004; Parks *et al.,* 2007, 2009; Di Iorio and Clark, 2009; Holt *et al.,* 2009).

These data demonstrating adaptations for reduced masking pertain mainly to the very high frequency echolocation signals of toothed whales. There is less information about the existence of corresponding mechanisms at moderate or low frequencies or in other types of marine mammals. For example, Zaitseva *et al.* (1980) found that, for the bottlenose dolphin, the angular separation between a sound source and a masking noise source had little effect on the degree of masking when the sound frequency was 18 kHz, in contrast to the pronounced effect at higher frequencies. Directional hearing has been demonstrated at frequencies as low as 0.5–2 kHz in several marine mammals, including killer whales (Richardson *et al.,* 1995a). This ability may be useful in reducing masking at these frequencies. In summary, high levels of sound generated by anthropogenic activities may act to mask the detection of weaker biologically important sounds by some marine mammals. This masking may be more prominent for lower frequencies. For higher frequencies, such as that used in echolocation by toothed whales, several mechanisms are available that may allow them to reduce the effects of such masking.

Threshold Shift (noise-induced loss of hearing)—When animals exhibit reduced hearing sensitivity (*i.e.,* sounds must be louder for an animal to detect them) following exposure to an intense sound or sound for long duration, it is referred to as a noise-induced threshold shift (TS). An animal can experience temporary threshold shift (TTS) or permanent threshold shift (PTS). TTS can last from minutes or hours to days (*i.e.,* there is complete recovery), can occur in specific frequency ranges (*i.e.,* an animal might only have a temporary loss of hearing sensitivity between the frequencies of 1 and 10 kHz), and can be of varying amounts (for example, an animal's hearing sensitivity might be reduced initially by only 6 dB or reduced by 30 dB). PTS is permanent, but some recovery is possible. PTS can also occur in a specific frequency range and amount as mentioned above for TTS.

The following physiological mechanisms are thought to play a role in inducing auditory TS: effects to sensory hair cells in the inner ear that reduce their sensitivity, modification of the chemical environment within the sensory cells, residual muscular activity in the middle ear, displacement of certain inner ear membranes, increased blood flow, and post-stimulatory reduction in both efferent and sensory neural output (Southall *et al.,* 2007). The amplitude, duration, frequency, temporal pattern, and energy distribution of sound exposure all can affect the amount of associated TS and the frequency range in which it occurs. As amplitude and duration of sound exposure increase, so, generally, does the amount of TS, along with the recovery time. For intermittent sounds, less TS could occur than compared to a continuous exposure with the same energy (some recovery could occur between intermittent exposures depending on the duty cycle between sounds) (Kryter *et al.,* 1966; Ward, 1997). For example, one short but loud (higher SPL) sound exposure may induce the same impairment as one longer but softer sound, which in turn may cause more impairment than a series of several intermittent softer sounds with the same total energy (Ward, 1997). Additionally, though TTS is temporary, prolonged exposure to sounds strong enough to elicit TTS, or shorter-term exposure to sound levels well above the TTS threshold, can cause PTS, at least in terrestrial mammals (Kryter, 1985). In the case of the seismic survey, animals are not expected to be exposed to levels high enough or durations long enough to result in PTS.

PTS is considered auditory injury (Southall *et al.,* 2007). Irreparable damage to the inner or outer cochlear hair cells may cause PTS; however, other mechanisms are also involved, such as exceeding the elastic limits of certain tissues and membranes in the middle and inner ears and resultant changes in the chemical composition of the inner ear fluids (Southall *et al.,* 2007).

Although the published body of scientific literature contains numerous theoretical studies and discussion papers on hearing impairments that can occur with exposure to a loud sound,

only a few studies provide empirical information on the levels at which noise-induced loss in hearing sensitivity occurs in nonhuman animals. For marine mammals, published data are limited to the captive bottlenose dolphin, beluga, harbor porpoise, and Yangtze finless porpoise (Finneran *et al.,* 2000, 2002b, 2003, 2005a, 2007, 2010a, 2010b; Finneran and Schlundt, 2010; Lucke *et al.,* 2009; Mooney *et al.,* 2009a, 2009b; Popov *et al.,* 2011a, 2011b; Kastelein *et al.,* 2012a; Schlundt *et al.,* 2000; Nachtigall *et al.,* 2003, 2004). For pinnipeds in water, data are limited to measurements of TTS in harbor seals, an elephant seal, and California sea lions (Kastak *et al.,* 1999, 2005; Kastelein *et al.,* 2012b).

Marine mammal hearing plays a critical role in communication with conspecifics, and interpretation of environmental cues for purposes such as predator avoidance and prey capture. Depending on the degree (elevation of threshold in dB), duration (*i.e.,* recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious (similar to those discussed in auditory masking, below). For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that occurs during a time where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during time when communication is critical for successful mother/calf interactions could have more serious impacts. Similarly, depending on the degree and frequency range, the effects of PTS on an animal could range in severity, although it is considered generally more serious because it is a permanent condition. Of note, reduced hearing sensitivity as a simple function of aging has been observed in marine mammals, as well as humans and other taxa (Southall *et al.,* 2007), so we can infer that strategies exist for coping with this condition to some degree, though likely not without cost.

Given the higher level of sound necessary to cause PTS as compared with TTS, it is considerably less likely that PTS would occur during the proposed seismic surveys in Cook Inlet. Cetaceans generally avoid the immediate area around operating seismic vessels, as do some other marine mammals. Some pinnipeds show avoidance reactions to airguns, but their avoidance reactions are generally not as strong or consistent as those of cetaceans, and occasionally they seem to be attracted to operating seismic vessels (NMFS, 2010).

Non-auditory Physical Effects: Non-auditory physical effects might occur in marine mammals exposed to strong underwater pulsed sound. Possible types of non-auditory physiological effects or injuries that theoretically might occur in mammals close to a strong sound source include stress, neurological effects, bubble formation, and other types of organ or tissue damage. Some marine mammal species (*i.e.,* beaked whales) may be especially susceptible to injury and/or stranding when exposed to strong pulsed sounds.

Classic stress responses begin when an animal's central nervous system perceives a potential threat to its homeostasis. That perception triggers stress responses regardless of whether a stimulus actually threatens the animal; the mere perception of a threat is sufficient to trigger a stress response (Moberg, 2000; Sapolsky *et al.,* 2005; Seyle, 1950). Once an animal's central nervous system perceives a threat, it mounts a biological response or defense that consists of a combination of the four general biological defense responses: behavioral responses; autonomic nervous system responses; neuroendocrine responses; or immune responses.

In the case of many stressors, an animal's first and most economical (in terms of biotic costs) response is behavioral avoidance of the potential stressor or avoidance of continued exposure to a stressor. An animal's second line of defense to stressors involves the sympathetic part of the autonomic nervous system and the classical ''fight or flight'' response, which includes the cardiovascular system, the gastrointestinal system, the exocrine glands, and the adrenal medulla to produce changes in heart rate, blood pressure, and gastrointestinal activity that humans commonly associate with ''stress.'' These responses have a relatively short duration and may or may not have significant long-term effects on an animal's welfare.

An animal's third line of defense to stressors involves its neuroendocrine or sympathetic nervous systems; the system that has received the most study has been the hypothalmus-pituitary-adrenal system (also known as the HPA axis in mammals or the hypothalamus-pituitary-interrenal axis in fish and some reptiles). Unlike stress responses associated with the autonomic nervous system, virtually all neuroendocrine functions that are affected by stress—including immune competence, reproduction, metabolism, and behavior—are regulated by pituitary hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction (Moberg, 1987; Rivier, 1995), altered metabolism (Elasser *et al.,* 2000), reduced immune competence (Blecha, 2000), and behavioral disturbance. Increases in the circulation of glucocorticosteroids (cortisol, corticosterone, and aldosterone in marine mammals; see Romano *et al.,* 2004) have been equated with stress for many years.

The primary distinction between stress (which is adaptive and does not normally place an animal at risk) and distress is the biotic cost of the response. During a stress response, an animal uses glycogen stores that can be quickly replenished once the stress is alleviated. In such circumstances, the cost of the stress response would not pose a risk to the animal's welfare. However, when an animal does not have sufficient energy reserves to satisfy the energetic costs of a stress response, energy resources must be diverted from other biotic functions, which impair those functions that experience the diversion. For example, when mounting a stress response diverts energy away from growth in young animals, those animals may experience stunted growth. When mounting a stress response diverts energy from a fetus, an animal's reproductive success and fitness will suffer. In these cases, the animals will have entered a pre-pathological or pathological state which is called ''distress'' (sensu Seyle, 1950) or ''allostatic loading'' (sensu McEwen and Wingfield, 2003). This pathological state will last until the animal replenishes its biotic reserves sufficient to restore normal function. Note that these examples involved a long-term (days or weeks) stress response due to exposure to stimuli.

Relationships between these physiological mechanisms, animal behavior, and the costs of stress responses have also been documented fairly well through controlled experiment; because this physiology exists in every vertebrate that has been studied, it is not surprising that stress responses and their costs have been documented in both laboratory and free-living animals (for examples see, Holberton *et al.,* 1996; Hood *et al.,* 1998; Jessop *et al.,* 2003; Krausman *et al.,* 2004; Lankford *et al.,* 2005; Reneerkens *et al.,* 2002; Thompson and Hamer, 2000). Although no information has been collected on the physiological responses of marine mammals to anthropogenic sound exposure, studies of other marine animals and terrestrial animals would lead us to expect some

marine mammals to experience physiological stress responses and, perhaps, physiological responses that would be classified as ''distress'' upon exposure to anthropogenic sounds.

For example, Jansen (1998) reported on the relationship between acoustic exposures and physiological responses that are indicative of stress responses in humans (*e.g.,* elevated respiration and increased heart rates). Jones (1998) reported on reductions in human performance when faced with acute, repetitive exposures to acoustic disturbance. Trimper *et al.* (1998) reported on the physiological stress responses of osprey to low-level aircraft noise while Krausman *et al.* (2004) reported on the auditory and physiology stress responses of endangered Sonoran pronghorn to military overflights. Smith *et al.* (2004a, 2004b) identified noise-induced physiological transient stress responses in hearing-specialist fish (*i.e.,* goldfish) that accompanied short- and long-term hearing losses. Welch and Welch (1970) reported physiological and behavioral stress responses that accompanied damage to the inner ears of fish and several mammals.

Hearing is one of the primary senses marine mammals use to gather information about their environment and communicate with conspecifics. Although empirical information on the effects of sensory impairment (TTS, PTS, and acoustic masking) on marine mammals remains limited, we assume that reducing a marine mammal's ability to gather information about its environment and communicate with other members of its species would induce stress, based on data that terrestrial animals exhibit those responses under similar conditions (NRC, 2003) and because marine mammals use hearing as their primary sensory mechanism. Therefore, we assume that acoustic exposures sufficient to trigger onset PTS or TTS would be accompanied by physiological stress responses. However, marine mammals also might experience stress responses at received levels lower than those necessary to trigger onset TTS. Based on empirical studies of the time required to recover from stress responses (Moberg, 2000), NMFS also assumes that stress responses could persist beyond the time interval required for animals to recover from TTS and might result in pathological and pre-pathological states that would be as significant as behavioral responses to TTS. Resonance effects (Gentry, 2002) and direct noise-induced bubble formations (Crum *et al.,* 2005) are implausible in the case of exposure to an impulsive broadband source like an airgun array. If seismic surveys disrupt diving patterns of deep-diving species, this might result in bubble formation and a form of the bends, as speculated to occur in beaked whales exposed to sonar. However, there is no specific evidence of this upon exposure to airgun pulses. Additionally, no beaked whale species occur in the proposed seismic survey area.

In general, very little is known about the potential for strong, anthropogenic underwater sounds to cause non-auditory physical effects in marine mammals. Such effects, if they occur at all, would presumably be limited to short distances and to activities that extend over a prolonged period. The available data do not allow identification of a specific exposure level above which non-auditory effects can be expected (Southall *et al.,* 2007) or any meaningful quantitative predictions of the numbers (if any) of marine mammals that might be affected in those ways. There is no definitive evidence that any of these effects occur even for marine mammals in close proximity to large arrays of airguns. In addition, marine mammals that show behavioral avoidance of seismic vessels, including belugas and some pinnipeds, are especially unlikely to incur non-auditory impairment or other physical effects. Therefore, it is unlikely that such effects would occur during SAE's proposed surveys given the brief duration of exposure and the planned monitoring and mitigation measures described later in this document.

Stranding and Mortality: Marine mammals close to underwater detonations of high explosive can be killed or severely injured, and the auditory organs are especially susceptible to injury (Ketten *et al.* 1993; Ketten 1995). Airgun pulses are less energetic and their peak amplitudes have slower rise times. To date, there is no evidence that serious injury, death, or stranding by marine mammals can occur from exposure to air gun pulses, even in the case of large air gun arrays.

However, in past IHA notices for seismic surveys, commenters have referenced two stranding events allegedly associated with seismic activities, one off Baja California and a second off Brazil. NMFS has addressed this concern several times, including in the **Federal Register** notice announcing the IHA for Apache Alaska's first seismic survey in 2012. Readers are encouraged to review NMFS's response to comments on this matter found in 69 FR 74905 (December 14, 2004), 71 FR 43112 (July 31, 2006), 71 FR 50027 (August 24, 2006), 71 FR 49418 (August 23, 2006), and 77 FR 27720 (May 11, 2012).

It should be noted that strandings related to sound exposure have not been recorded for marine mammal species in Cook Inlet. Beluga whale strandings in Cook Inlet are not uncommon; however, these events often coincide with extreme tidal fluctuations (''spring tides'') or killer whale sightings (Shelden *et al.,* 2003). For example, in August 2012, a group of Cook Inlet beluga whales stranded in the mud flats of Turnagain Arm during low tide and were able to swim free with the flood tide. No strandings or marine mammals in distress were observed during the 2D test survey conducted by Apache in March 2011, and none were reported by Cook Inlet inhabitants. As a result, NMFS does not expect any marine mammals will incur serious injury or mortality in Cook Inlet or strand as a result of the proposed seismic survey.

2. Potential Effects From Pingers on Marine Mammals

Active acoustic sources other than the airguns have been proposed for SAE's oil and gas exploration seismic survey program in Cook Inlet. The specifications for the pingers (source levels and frequency ranges) were provided earlier in this document. In general, pingers are known to cause behavioral disturbance and are commonly used to deter marine mammals from commercial fishing gear or fish farms. Due to the potential to change marine mammal behavior, shut downs described for airguns will also be applied to pinger use.

Vessel Impacts

Vessel activity and noise associated with vessel activity will temporarily increase in the action area during SAE's seismic survey as a result of the operation of nine vessels. To minimize the effects of vessels and noise associated with vessel activity, SAE will follow NMFS's Marine Mammal Viewing Guidelines and Regulations and will alter heading or speed if a marine mammal gets too close to a vessel. In addition, vessels will be operating at slow speed (4–5 knots) when conducting surveys and in a purposeful manner to and from work sites in as direct a route as possible. Marine mammal monitoring observers and passive acoustic devices will alert vessel captains as animals are detected to ensure safe and effective measures are applied to avoid coming into direct contact with marine mammals. Therefore, NMFS neither anticipates nor authorizes takes of marine mammals from ship strikes.

Odontocetes, such as beluga whales, killer whales, and harbor porpoises, often show tolerance to vessel activity; however, they may react at long distances if they are confined by ice, shallow water, or were previously harassed by vessels (Richardson *et al.,* 1995). Beluga whale response to vessel noise varies greatly from tolerance to extreme sensitivity depending on the activity of the whale and previous experience with vessels (Richardson *et al.,* 1995). Reactions to vessels depend on whale activities and experience, habitat, boat type, and boat behavior (Richardson *et al.,* 1995) and may include behavioral responses, such as altered headings or avoidance (Blane and Jaakson, 1994; Erbe and Farmer, 2000); fast swimming; changes in vocalizations (Lesage *et al.,* 1999; Scheifele *et al.,* 2005); and changes in dive, surfacing, and respiration patterns.

There are few data published on pinniped responses to vessel activity, and most of the information is anecdotal (Richardson *et al.,* 1995). Generally, sea lions in water show tolerance to close and frequently approaching vessels and sometimes show interest in fishing vessels. They are less tolerant when hauled out on land; however, they rarely react unless the vessel approaches within 100–200 m (330–660 ft; reviewed in Richardson *et al.,* 1995).

Entanglement

Although some of SAE's equipment contains cables or lines, the risk of entanglement is extremely remote. Additionally, mortality from entanglement is not anticipated. The material used by SAE and the amount of slack is not anticipated to allow for marine mammal entanglements.

Anticipated Effects on Marine Mammal Habitat

The primary potential impacts to marine mammal habitat and other marine species are associated with elevated sound levels produced by airguns and other active acoustic sources. However, other potential impacts to the surrounding habitat from physical disturbance are also possible. This section describes the potential impacts to marine mammal habitat from the specified activity. Because the marine mammals in the area feed on fish and/or invertebrates there is also information on the species typically preyed upon by the marine mammals in the area. As noted earlier, upper Cook Inlet is an important feeding and calving area for the Cook Inlet beluga whale and critical habitat has been designated for this species in the proposed seismic survey area.

Common Marine Mammal Prey in the Project Area

Fish are the primary prey species for marine mammals in upper Cook Inlet. Beluga whales feed on a variety of fish, shrimp, squid, and octopus (Burns and Seaman, 1986). Common prey species in Knik Arm include salmon, eulachon and cod. Harbor seals feed on fish such as pollock, cod, capelin, eulachon, Pacific herring, and salmon, as well as a variety of benthic species, including crabs, shrimp, and cephalopods. Harbor seals are also opportunistic feeders with their diet varying with season and location. The preferred diet of the harbor seal in the Gulf of Alaska consists of pollock, octopus, capelin, eulachon, and Pacific herring (Calkins, 1989). Other prey species include cod, flat fishes, shrimp, salmon, and squid (Hoover, 1988). Harbor porpoises feed primarily on Pacific herring, cod, whiting (hake), pollock, squid, and octopus (Leatherwood *et al.,* 1982). In the upper Cook Inlet area, harbor porpoise feed on squid and a variety of small schooling fish, which would likely include Pacific herring and eulachon (Bowen and Siniff, 1999; NMFS, unpublished data). Killer whales feed on either fish or other marine mammals depending on genetic type (resident versus transient respectively). Killer whales in Knik Arm are typically the transient type (Shelden *et al.,* 2003) and feed on beluga whales and other marine mammals, such as harbor seal and harbor porpoise. The Steller sea lion diet consists of a variety of fishes (capelin, cod, herring, mackerel, pollock, rockfish, salmon, sand lance, etc.), bivalves, squid, octopus, and gastropods.

Potential Impacts on Prey Species

With regard to fish as a prey source for cetaceans and pinnipeds, fish are known to hear and react to sounds and to use sound to communicate (Tavolga *et al.,* 1981) and possibly avoid predators (Wilson and Dill, 2002). Experiments have shown that fish can sense both the strength and direction of sound (Hawkins, 1981). Primary factors determining whether a fish can sense a sound signal, and potentially react to it, are the frequency of the signal and the strength of the signal in relation to the natural background sound level.

Fishes produce sounds that are associated with behaviors that include territoriality, mate search, courtship, and aggression. It has also been speculated that sound production may provide the means for long distance communication and communication under poor underwater visibility conditions (Zelick *et al.,* 1999), although the fact that fish communicate at low-frequency sound levels where the masking effects of ambient noise are naturally highest suggests that very long distance communication would rarely be possible. Fishes have evolved a diversity of sound generating organs and acoustic signals of various temporal and spectral contents. Fish sounds vary in structure, depending on the mechanism used to produce them (Hawkins, 1993). Generally, fish sounds are predominantly composed of low frequencies (less than 3 kHz).

Since objects in the water scatter sound, fish are able to detect these objects through monitoring the ambient noise. Therefore, fish are probably able to detect prey, predators, conspecifics, and physical features by listening to environmental sounds (Hawkins, 1981). There are two sensory systems that enable fish to monitor the vibration-based information of their surroundings. The two sensory systems, the inner ear and the lateral line, constitute the acoustico-lateralis system.

Although the hearing sensitivities of very few fish species have been studied to date, it is becoming obvious that the intra- and inter-specific variability is considerable (Coombs, 1981). Nedwell *et al.* (2004) compiled and published available fish audiogram information. A noninvasive electrophysiological recording method known as auditory brainstem response is now commonly used in the production of fish audiograms (Yan, 2004). Popper and Carlson (1998) and the Navy (2001) found that fish generally perceive underwater sounds in the frequency range of 50–2,000 Hz, with peak sensitivities below 800 Hz. Even though some fish are able to detect sounds in the ultrasonic frequency range, the thresholds at these higher frequencies tend to be considerably higher than those at the lower end of the auditory frequency range.

Fish are sensitive to underwater impulsive sounds due to swim bladder resonance. As the pressure wave passes through a fish, the swim bladder is rapidly squeezed as the high pressure wave, and then the under pressure component of the wave, passes through the fish. The swim bladder may repeatedly expand and contract at the high sound pressure levels, creating pressure on the internal organs surrounding the swim bladder.

Literature relating to the impacts of sound on marine fish species can be divided into the following categories: (1) Pathological effects; (2) physiological effects; and (3) behavioral effects. Pathological effects include lethal and

sub-lethal physical damage to fish; physiological effects include primary and secondary stress responses; and behavioral effects include changes in exhibited behaviors of fish. Behavioral changes might be a direct reaction to a detected sound or a result of the anthropogenic sound masking natural sounds that the fish normally detect and to which they respond. The three types of effects are often interrelated in complex ways. For example, some physiological and behavioral effects could potentially lead to the ultimate pathological effect of mortality. Hastings and Popper (2005) reviewed what is known about the effects of sound on fishes and identified studies needed to address areas of uncertainty relative to measurement of sound and the responses of fishes. Popper *et al.* (2003/2004) also published a paper that reviews the effects of anthropogenic sound on the behavior and physiology of fishes.

The level of sound at which a fish will react or alter its behavior is usually well above the detection level. Fish have been found to react to sounds when the sound level increased to about 20 dB above the detection level of 120 dB (Ona, 1988); however, the response threshold can depend on the time of year and the fish's physiological condition (Engas *et al.,* 1993). In general, fish react more strongly to pulses of sound rather than a continuous signal (Blaxter *et al.,* 1981), and a quicker alarm response is elicited when the sound signal intensity rises rapidly compared to sound rising more slowly to the same level.

Investigations of fish behavior in relation to vessel noise (Olsen *et al.,* 1983; Ona, 1988; Ona and Godo, 1990) have shown that fish react when the sound from the engines and propeller exceeds a certain level. Avoidance reactions have been observed in fish such as cod and herring when vessels approached close enough that received sound levels are 110 dB to 130 dB (Nakken, 1992; Olsen, 1979; Ona and Godo, 1990; Ona and Toresen, 1988). However, other researchers have found that fish such as polar cod, herring, and capelin are often attracted to vessels (apparently by the noise) and swim toward the vessel (Rostad *et al.,* 2006). Typical sound source levels of vessel noise in the audible range for fish are 150 dB to 170 dB (Richardson *et al.,* 1995).

Carlson (1994), in a review of 40 years of studies concerning the use of underwater sound to deter salmonids from hazardous areas at hydroelectric dams and other facilities, concluded that salmonids were able to respond to low-frequency sound and to react to sound sources within a few feet of the source. He speculated that the reason that underwater sound had no effect on salmonids at distances greater than a few feet is because they react to water particle motion/acceleration, not sound pressures. Detectable particle motion is produced within very short distances of a sound source, although sound pressure waves travel farther.

Potential Impacts to the Benthic Environment

SAE's seismic survey requires the deployment of a submersible recording system in the inter-tidal and marine zones. An autonomous ''nodal'' (*i.e.,* no cables) system would be placed on the seafloor by specific vessels in lines parallel to each other with a node line spacing of 402 m (0.25 mi). Each nodal ''patch'' would have 32 node lines parallel to each other. The lines generally run perpendicular to the shoreline. An entire patch would be placed on the seafloor prior to airgun activity. As the patches are surveyed, the node lines would be moved either side to side or inline to the next location. Placement and retrieval of the nodes may cause temporary and localized increases in turbidity on the seafloor. The substrate of Cook Inlet consists of glacial silt, clay, cobbles, pebbles, and sand (Sharma and Burrell, 1970). Sediments like sand and cobble dissipate quickly when suspended, but finer materials like clay and silt can create thicker plumes that may harm fish; however, the turbidity created by placing and removing nodes on the seafloor would settle to background levels within minutes after the cessation of activity.

In addition, seismic noise will radiate throughout the water column from airguns and pingers until it dissipates to background levels. No studies have demonstrated that seismic noise affects the life stages, condition, or amount of food resources (fish, invertebrates, eggs) used by marine mammals, except when exposed to sound levels within a few meters of the seismic source or in few very isolated cases. Where fish or invertebrates did respond to seismic noise, the effects were temporary and of short duration. Consequently, disturbance to fish species due to the activities associated with the seismic survey (*i.e.,* placement and retrieval of nodes and noise from sound sources) would be short term and fish would be expected to return to their pre-disturbance behavior once seismic survey activities cease.

Based on the preceding discussion, the proposed activity is not expected to have any habitat-related effects that could cause significant or long-term consequences for individual marine mammals or their populations.

Proposed Mitigation

In order to issue an incidental take authorization (ITA) under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (where relevant).

Mitigation Measures Proposed by SAE

For the proposed mitigation measures, SAE listed the following protocols to be implemented during its seismic survey program in Cook Inlet.

1. Operation of Mitigation Airgun at Night

SAE proposes to conduct both daytime and nighttime operations. Nighttime operations would be initiated only if a ''mitigation airgun'' (typically the 10 in^3) has been continuously operational from the time that PSO monitoring has ceased for the day. Seismic activity would not ramp up from an extended shut-down (*i.e.,* when the airgun has been down with no activity for at least 10 minutes) during nighttime operations, and survey activities would be suspended until the following day. At night, the vessel captain and crew would maintain lookout for marine mammals and would order the airgun(s) to be shut down if marine mammals are observed in or about to enter the established exclusion zones.

2. Exclusion and Disturbance Zones

SAE proposes to establish exclusion zones to avoid Level A harassment (''injury exclusion zone'') of all marine mammals and to avoid Level B harassment (''disturbance exclusion zone'') of any beluga whales or groups of five or more killer whales or harbor porpoises detected within the designated zones. The injury exclusion zone will correspond to the area around the source within which received levels equal or exceed 180 dB re 1 μPa [rms] for cetaceans and 190 dB re 1 μPa [rms] for pinnipeds and SAE will shut down or power down operations if any marine mammals are seen approaching or entering this zone (more detail below). The disturbance exclusion zone will correspond to the area around the

source within which received levels equal or exceed 160 dB re 1 μPa [rms] and SAE will implement power down and/or shutdown measures, as appropriate, if any beluga whales or group of five or more killer whales or harbor porpoises are seen entering or approaching the disturbance exclusion zone.

3. Power Down and Shutdown Procedures

A power down is the immediate reduction in the number of operating energy sources from a full array firing to a mitigation airgun. A shutdown is the immediate cessation of firing of all energy sources. The arrays will be immediately powered down whenever a marine mammal is sighted approaching close to or within the applicable exclusion zone of the full arrays but is outside the applicable exclusion zone of the single source. If a marine mammal is sighted within the applicable exclusion zone of the single energy source, the entire array will be shutdown (*i.e.,* no sources firing). Following a power down or a shutdown, airgun activity will not resume until the marine mammal has clearly left the applicable injury or disturbance exclusion zone. The animal will be considered to have cleared the zone if it: (1) Is visually observed to have left the zone; (2) has not been seen within the zone for 15 minutes in the case of pinnipeds and small odontocetes; or (3) has not been seen within the zone for 30 minutes in the case of large odontocetes, including killer whales and belugas.

4. Ramp-up Procedures

A ramp-up of an airgun array provides a gradual increase in sound levels, and involves a step-wise increase in the number and total volume of air guns firing until the full volume is achieved. The purpose of a ramp-up (or ''soft start'') is to ''warn'' cetaceans and pinnipeds in the vicinity of the airguns and to provide the time for them to leave the area and thus avoid any potential injury or impairment of their hearing abilities.

During the proposed seismic survey, the seismic operator will ramp up the airgun array slowly. NMFS proposes that the rate of ramp-up to be no more than 6 dB per 5-minute period. Ramp-up is used at the start of airgun operations, after a power- or shut-down, and after any period of greater than 10 minutes in duration without airgun operations (*i.e.,* extended shutdown).

A full ramp-up after a shutdown will not begin until there has been a minimum of 30 minutes of observation of the applicable exclusion zone by PSOs to assure that no marine mammals are present. The entire exclusion zone must be visible during the 30-minute lead-in to a full ramp up. If the entire exclusion zone is not visible, then ramp-up from a cold start cannot begin. If a marine mammal(s) is sighted within the injury exclusion zone during the 30-minute watch prior to ramp-up, ramp-up will be delayed until the marine mammal(s) is sighted outside of the zone or the animal(s) is not sighted for at least 15–30 minutes: 15 minutes for small odontocetes and pinnipeds (*e.g.* harbor porpoises, harbor seals, and Steller sea lions), or 30 minutes for large odontocetes (*e.g.,* killer whales and beluga whales).

5. Speed or Course Alteration

If a marine mammal is detected outside the Level A injury exclusion zone and, based on its position and the relative motion, is likely to enter that zone, the vessel's speed and/or direct course may, when practical and safe, be changed to also minimize the effect on the seismic program. This can be used in coordination with a power down procedure. The marine mammal activities and movements relative to the seismic and support vessels will be closely monitored to ensure that the marine mammal does not approach within the applicable exclusion radius. If the mammal appears likely to enter the exclusion radius, further mitigative actions will be taken, *i.e.,* either further course alterations, power down, or shut down of the airgun(s).

6. Measures for Beluga Whales and Groups of Killer Whales and Harbor Porpoises

The following additional protective measures for beluga whales and groups of five or more killer whales and harbor porpoises are proposed. Specifically, a 160-dB vessel monitoring zone would be established and monitored in Cook Inlet during all seismic surveys. If a beluga whale or groups of five or more killer whales and/or harbor porpoises are visually sighted approaching or within the 160-dB disturbance zone, survey activity would not commence until the animals are no longer present within the 160-dB disturbance zone. Whenever beluga whales or groups of five or more killer whales and/or harbor porpoises are detected approaching or within the 160-dB disturbance zone, the airguns may be powered down before the animal is within the 160-dB disturbance zone, as an alternative to a complete shutdown. If a power down is not sufficient, the sound source(s) shall be shut-down until the animals are no longer present within the 160-dB zone.

Additional Mitigation Measures Proposed by NMFS

In addition to the mitigation measures above, NMFS proposes implementation of the following mitigation measures.

SAE will not operate airguns within 10 miles (16 km) of the mean higher high water (MHHW) line of the Susitna Delta (Beluga River to the Little Susitna River) between April 15 and October 15. The purpose of this mitigation measure is to protect beluga whales in the designated critical habitat in this area that is important for beluga whale feeding and calving during the spring and fall months. The range of the setback required by NMFS was designated to protect this important habitat area and also to create an effective buffer where sound does not encroach on this habitat. This seasonal exclusion is proposed to be in effect from April 15-October 15. Activities can occur within this area from October 16-April 14.

The mitigation airgun will be operated at approximately one shot per minute, only during daylight and when there is good visibility, and will not be operated for longer than 3 hours in duration. In cases when the next start-up after the turn is expected to be during lowlight or low visibility, use of the mitigation airgun may be initiated 30 minutes before darkness or low visibility conditions occur and may be operated until the start of the next seismic acquisition line. The mitigation gun must still be operated at approximately one shot per minute.

NMFS proposes that SAE must suspend seismic operations if a live marine mammal stranding is reported in Cook Inlet coincident to, or within 72 hours of, seismic survey activities involving the use of airguns (regardless of any suspected cause of the stranding). The shutdown must occur if the animal is within a distance two times that of the 160 dB isopleth of the largest airgun array configuration in use. This distance was chosen to create an additional buffer beyond the distance at which animals would typically be considered harassed, as animals involved in a live stranding event are likely compromised, with potentially increased susceptibility to stressors, and the goal is to decrease the likelihood that they are further disturbed or impacted by the seismic survey, regardless of what the original cause of the stranding event was. Shutdown procedures will remain in effect until NMFS determines and advises SAE that all live animals involved in the stranding have left the

area (either of their own volition or following herding by responders).

Finally, NMFS proposes that if any marine mammal species are encountered, during seismic activities for which take is not authorized, that are likely to be exposed to sound pressure levels (SPLs) greater than or equal to 160 dB re 1 μPa (rms), then SAE must alter speed or course, power down or shut-down the sound source to avoid take of those species.

Mitigation Conclusions

NMFS has carefully evaluated SAE's proposed mitigation measures and considered a range of other measures in the context of ensuring that NMFS prescribes the means of effecting the least practicable adverse impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another:

- The manner in which, and the degree to which, the successful implementation of the measures are expected to minimize adverse impacts to marine mammals;
- The proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and
- The practicability of the measure for applicant implementation.

Any mitigation measure(s) prescribed by NMFS should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed below:

1. Avoidance or minimization of injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal).

2. A reduction in the numbers of marine mammals (total number or number at biologically important time or location) exposed to received levels of seismic airguns, or other activities expected to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing harassment takes only).

3. A reduction in the number of times (total number or number at biologically important time or location) individuals would be exposed to received levels of seismic airguns or other activities expected to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing harassment takes only).

4. A reduction in the intensity of exposures (either total number or number at biologically important time or location) to received levels of seismic airguns or other activities expected to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing the severity of harassment takes only).

5. Avoidance or minimization of adverse effects to marine mammal habitat, paying special attention to the food base, activities that block or limit passage to or from biologically important areas, permanent destruction of habitat, or temporary destruction/disturbance of habitat during a biologically important time.

6. For monitoring directly related to mitigation—an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS has preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable adverse impact on marine mammals species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Proposed Monitoring and Reporting

In order to issue an ITA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth ''requirements pertaining to the monitoring and reporting of such taking''. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for ITAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area. SAE submitted information regarding marine mammal monitoring to be conducted during seismic operations as part of the proposed IHA application. That information can be found in Sections 11 and 13 of the application. The monitoring measures may be modified or supplemented based on comments or new information received from the public during the public comment period.

Monitoring measures proposed by the applicant or prescribed by NMFS should contribute to or accomplish one or more of the following top-level goals:

1. An increase in our understanding of the likely occurrence of marine mammal species in the vicinity of the action, *i.e.,* presence, abundance, distribution, and/or density of species.

2. An increase in our understanding of the nature, scope, or context of the likely exposure of marine mammal species to any of the potential stressor(s) associated with the action (*e.g.* sound or visual stimuli), through better understanding of one or more of the following: the action itself and its environment (*e.g.* sound source characterization, propagation, and ambient noise levels); the affected species (*e.g.* life history or dive pattern); the likely co-occurrence of marine mammal species with the action (in whole or part) associated with specific adverse effects; and/or the likely biological or behavioral context of exposure to the stressor for the marine mammal (*e.g.* age class of exposed animals or known pupping, calving or feeding areas).

3. An increase in our understanding of how individual marine mammals respond (behaviorally or physiologically) to the specific stressors associated with the action (in specific contexts, where possible, *e.g.,* at what distance or received level).

4. An increase in our understanding of how anticipated individual responses, to individual stressors or anticipated combinations of stressors, may impact either: the long-term fitness and survival of an individual; or the population, species, or stock (*e.g.,* through effects on annual rates of recruitment or survival).

5. An increase in our understanding of how the activity affects marine mammal habitat, such as through effects on prey sources or acoustic habitat (*e.g.,* through characterization of longer-term contributions of multiple sound sources to rising ambient noise levels and assessment of the potential chronic effects on marine mammals).

6. An increase in understanding of the impacts of the activity on marine mammals in combination with the impacts of other anthropogenic activities or natural factors occurring in the region.

7. An increase in our understanding of the effectiveness of mitigation and monitoring measures.

8. An increase in the probability of detecting marine mammals (through improved technology or methodology), both specifically within the safety zone (thus allowing for more effective implementation of the mitigation) and in general, to better achieve the above goals.

Proposed Monitoring Measures

1. Visual Vessel-Based Monitoring

Vessel-based monitoring for marine mammals would be done by experienced PSOs throughout the period of marine survey activities. PSOs

would monitor the occurrence and behavior of marine mammals near the survey vessel during all daylight periods (nautical dawn to nautical dusk) during operation and during most daylight periods when airgun operations are not occurring. PSO duties would include watching for and identifying marine mammals, recording their numbers, distances, and reactions to the survey operations, and documenting observed ''take by harassment'' as defined by NMFS.

A minimum number of six PSOs (two per source vessel and two per support vessel) would be required onboard the survey vessel to meet the following criteria: (1) 100 Percent monitoring coverage during all periods of survey operations in daylight (nautical twilight-dawn to nautical twilight-dusk; (2) maximum of 4 consecutive hours on watch per PSO; and (3) maximum of 12 hours of watch time per day per PSO.

PSO teams would consist of NMFS-approved field biologists. An experienced field crew leader would supervise the PSO team onboard the survey vessel. SAE currently plans to have PSOs aboard three vessels: The two source vessels and one support vessel (*M/V Dreamcatcher*). Two PSOs would be on the source vessels, and two PSOs would be on the support vessel to observe and implement the exclusion, power down, and shut down areas. When marine mammals are about to enter or are sighted within designated harassment and exclusion zones, airgun or pinger operations would be powered down (when applicable) or shut down immediately. The vessel-based observers would watch for marine mammals during all periods when sound sources are in operation and for a minimum of 30 minutes prior to the start of airgun or pinger operations after an extended shut down.

The observer(s) would watch for marine mammals from the best available vantage point on the source and support vessels, typically the flying bridge. The observer(s) would scan systematically with the unaided eye and 7 x 50 reticle binoculars, assisted by 40 x 80 long-range binoculars.

All observations would be recorded in a standardized format. When a mammal sighting is made, the following information about the sighting would be recorded:

- Species, group size, age/size/sex categories (if determinable), sighting cue, behavior when first sighted and after initial sighting, time of sighting, heading (if consistent), bearing and distance from the PSO, direction and speed relative to vessel, apparent reaction to activities (*e.g.,* none, avoidance, approach, paralleling, etc.), closest point of approach, and behavioral pace;
- Time, location, speed, activity of the vessel (*e.g.,* seismic airguns off, pingers on, etc.), sea state, ice cover, visibility, and sun glare; and
- The positions of other vessel(s) in the vicinity of the PSO location.

The ship's position, speed of support vessels, and water temperature, water depth, sea state, ice cover, visibility, and sun glare would also be recorded at the start and end of each observation watch, every 30 minutes during a watch, and whenever there is a change in any of those variables.

2. Visual Shore-Based Monitoring

In addition to the vessel-based PSOs, SAE proposes to utilize shore-based monitoring daily in the event of summer seismic activity occurring nearshore to Cook Inlet beluga Critical Habitat Area 1, to visually monitor for marine mammals. The shore-based PSOs would scan the area prior to, during, and after the airgun operations and would be in contact with the vessel-based PSOs via radio to communicate sightings of marine mammals approaching or within the project area. This communication will allow the vessel-based observers to go on a ''heightened'' state of alert regarding occurrence of marine mammals in the area and aid in timely implementation of mitigation measures.

Reporting Measures

Immediate reports will be submitted to NMFS if 25 belugas are detected in the Level B disturbance exclusion zone to evaluate and make necessary adjustments to monitoring and mitigation. If the number of detected takes for any marine mammal species is met or exceeded, SAE will immediately cease survey operations involving the use of active sound sources (*e.g.,* airguns and pingers) and notify NMFS.

1. Weekly Reports

SAE would submit a weekly field report to NMFS Headquarters as well as the Alaska Regional Office, no later than close of business each Thursday during the weeks when in-water seismic survey activities take place. The weekly field reports would summarize species detected (number, location, distance from seismic vessel, behavior), in-water activity occurring at the time of the sighting (discharge volume of array at time of sighting, seismic activity at time of sighting, visual plots of sightings, and number of power downs and shutdowns), behavioral reactions to in-water activities, and the number of marine mammals exposed.

2. Monthly Reports

Monthly reports will be submitted to NMFS for all months during which in-water seismic activities take place. The monthly report will contain and summarize the following information:

- Dates, times, locations, heading, speed, weather, sea conditions (including Beaufort sea state and wind force), and associated activities during all seismic operations and marine mammal sightings.
- Species, number, location, distance from the vessel, and behavior of any sighted marine mammals, as well as associated seismic activity (number of power-downs and shutdowns), observed throughout all monitoring activities.
- An estimate of the number (by species) of: (i) Pinnipeds that have been exposed to the seismic activity (based on visual observation) at received levels greater than or equal to 160 dB re 1 µPa (rms) and/or 190 dB re 1 µPa (rms) with a discussion of any specific behaviors those individuals exhibited; and (ii) cetaceans that have been exposed to the seismic activity (based on visual observation) at received levels greater than or equal to 160 dB re 1 µPa (rms) and/or 180 dB re 1 µPa (rms) with a discussion of any specific behaviors those individuals exhibited.
- A description of the implementation and effectiveness of the: (i) Terms and conditions of the Biological Opinion's Incidental Take Statement (ITS); and (ii) mitigation measures of the IHA. For the Biological Opinion, the report shall confirm the implementation of each Term and Condition, as well as any conservation recommendations, and describe their effectiveness for minimizing the adverse effects of the action on ESA-listed marine mammals.

3. Annual Reports

SAE would submit an annual report to NMFS's Permits and Conservation Division within 90 days after the end of operations on the water or at least 90 days prior to requiring a subsequent authorization, whichever comes first. The annual report would include:

- Summaries of monitoring effort (*e.g.,* total hours, total distances, and marine mammal distribution through the study period, accounting for sea state and other factors affecting visibility and detectability of marine mammals).
- Analyses of the effects of various factors influencing detectability of marine mammals (*e.g.,* sea state, number of observers, and fog/glare).
- Species composition, occurrence, and distribution of marine mammal

sightings, including date, water depth, numbers, age/size/gender categories (if determinable), group sizes, and ice cover.

- Analyses of the effects of survey operations.
- Sighting rates of marine mammals during periods with and without seismic survey activities (and other variables that could affect detectability), such as: (i) Initial sighting distances versus survey activity state; (ii) closest point of approach versus survey activity state; (iii) observed behaviors and types of movements versus survey activity state; (iv) numbers of sightings/individuals seen versus survey activity state; (v) distribution around the source vessels versus survey activity state; and (vi) numbers of animals detected in the 160 dB harassment (disturbance exclusion) zone.

NMFS would review the draft annual report. SAE must then submit a final annual report to the Chief, Permits and Conservation Division, Office of Protected Resources, NMFS, within 30 days after receiving comments from NMFS on the draft annual report. If NMFS decides that the draft annual report needs no comments, the draft report shall be considered to be the final report.

4. Notification of Injured or Dead Marine Mammals

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this Authorization, such as an injury (Level A harassment), serious injury or mortality (*e.g.,* ship-strike, gear interaction, and/or entanglement), SAE shall immediately cease the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, her designees, and the Alaska Regional Stranding Coordinators. The report must include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Name and type of vessel involved;
- Vessel's speed during and leading up to the incident;
- Description of the incident;
- Status of all sound source use in the 24 hours preceding the incident;
- Water depth;
- Environmental conditions (*e.g.,* wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with SAE to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. SAE may not resume their activities until notified by NMFS via letter or email, or telephone.

In the event that SAE discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.,* in less than a moderate state of decomposition as described in the next paragraph), SAE would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, her designees, and the NMFS Alaska Stranding Hotline. The report must include the same information identified in the paragraph above. Activities may continue while NMFS reviews the circumstances of the incident. NMFS would work with SAE to determine whether modifications in the activities are appropriate.

In the event that SAE discovers an injured or dead marine mammal, and the lead PSO determines that the injury or death is not associated with or related to the authorized activities (*e.g.,* previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), SAE shall report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, her designees, the NMFS Alaska Stranding Hotline, and the Alaska Regional Stranding Coordinators within 24 hours of the discovery. SAE shall provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network. Activities may continue while NMFS reviews the circumstances of the incident.

Monitoring Results From Previously Authorized Activities

While SAE has previously applied for Authorizations for work in Cook Inlet, Alaska, work was not conducted upon receiving the Authorization. SAE has previously conducted work under Incidental Harassment Authorizations in the Beaufort Sea.

Estimated Take by Incidental Harassment

Except with respect to certain activities not pertinent here, section 3(18) of 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; 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]. Only take by Level B behavioral harassment is anticipated as a result of the proposed seismic survey program with proposed mitigation. Anticipated impacts to marine mammals are associated with noise propagation from the sound sources (*e.g.,* airguns and pingers) used in the seismic survey; no take is expected to result from vessel strikes because of the slow speed of the vessels (4–5 knots).

SAE requests authorization to take nine marine mammal species by Level B harassment. These nine marine mammal species are: Cook Inlet beluga whale; humpback whale; minke whale; killer whale; harbor porpoise; Dall's porpoise; gray whale; harbor seal; and Steller sea lion.

For impulse sounds, such as those produced by airgun(s) used in the seismic survey, NMFS uses the 160 dB re 1μPa (rms) isopleth to indicate the onset of Level B harassment. The current Level A (injury) harassment threshold is 180 dB (rms) for cetaceans and 190 dB (rms) for pinnipeds. The NMFS annual aerial survey data from 2002–2012 was used to derive density estimates for each species (number of individuals/km^2).

Applicable Zones for Estimating ''Take by Harassment''

To estimate potential takes by Level B harassment for this proposed authorization, as well as for mitigation radii to be implemented by PSOs, ranges to the 160 dB (rms), 180 dB, and 190 dB isopleths were estimated at three different water depths (5 m, 25 m, and 45 m) . The distances to this threshold for the nearshore survey locations are provided in Table 4 in SAE's application. The distances to the thresholds provided in Table 4 in SAE's application correspond to the broadside and endfire directions.

Compared to the airguns, the relevant isopleths for the positioning pinger are quite small. The distances to the 190, 180, and 160 dB (rms) isopleths are 1 m,

3 m, and 25 m (3.3, 10, and 82 ft), respectively.

Estimates of Marine Mammal Density

SAE used one method to estimate densities for Cook Inlet beluga whales and another method for the other marine mammals in the area expected to be taken by harassment. Both methods are described in this document.

1. Beluga Whale Density Estimates

In similar fashion to a previous IHA issued to Apache, SAE used a habitat-based model developed by Goetz *et al.* (2012a). Information from that model has once again been used to estimate densities of beluga whales in Cook Inlet and we consider it to be the best available information on beluga density. A summary of the model is provided here, and additional detail can be found in Goetz *et al.* (2012a). To develop NMML's estimated densities of belugas, Goetz *et al.* (2012a) developed a model based on aerial survey data, depth soundings, coastal substrate type, environmental sensitivity index, anthropogenic disturbance, and anadromous fish streams to predict beluga densities throughout Cook Inlet. The result of this work is a beluga density map of Cook Inlet, which easily sums the belugas predicted within a given geographic area. NMML developed its predictive habitat model from the distribution and group size of beluga whales observed between 1994 and 2008. A 2-part ''hurdle'' model (a hurdle model in which there are two processes, one generating the zeroes and one generating the positive values) was applied to describe the physical and anthropogenic factors that influence (1) beluga presence (mixed model logistic regression) and (2) beluga count data (mixed model Poisson regression). Beluga presence was negatively associated with sources of anthropogenic disturbance and positively associated with fish availability and access to tidal flats and sandy substrates. Beluga group size was positively associated with tidal flats and proxies for seasonally available fish. Using this analysis, Goetz *et al.* (2012) produced habitat maps for beluga presence, group size, and the expected number of belugas in each 1 km^2 cell of Cook Inlet. The habitat-based model developed by NMML uses a Geographic Information System (GIS). A GIS is a computer system capable of capturing, storing, analyzing, and displaying geographically referenced information; that is, data identified according to location. However, the Goetz *et al.* (2012) model does not incorporate seasonality into the density estimates. Rather, SAE factors in seasonal considerations of beluga density into the design of the survey tracklines and locations (as discussion in more detail later in this document) in addition to other factors such as weather, ice conditions, and seismic needs.

2. Non-Beluga Whale Species Density Estimates

Densities of other marine mammals in the proposed project area were estimated from the annual aerial surveys conducted by NMFS for Cook Inlet beluga whale between 2000 and 2012 in June (Rugh *et al.,* 2000, 2001, 2002, 2003, 2004b, 2005b, 2006, 2007; Shelden *et al.,* 2008, 2009, 2010, 2012; Hobbs *et al.,* 2011). These surveys were flown in June to collect abundance data of beluga whales, but sightings of other marine mammals were also reported. Although these data were only collected in one month each year, these surveys provide the best available relatively long term data set for sighting information in the proposed project area. The general trend in marine mammal sighting is that beluga whales and harbor seals are seen most frequently in upper Cook Inlet, with higher concentrations of harbor seals near haul out sites on Kalgin Island and of beluga whales near river mouths, particularly the Susitna River. The other marine mammals of interest for this authorization (humpback whales, gray whales, minke whales, killer whales, harbor porpoises, Dall's porpoises, Steller sea lions) are observed infrequently in upper Cook Inlet and more commonly in lower Cook Inlet. In addition, these densities are calculated based on a relatively large area that was surveyed, much larger than the proposed area for a given year of seismic data acquisition. Furthermore, these annual aerial surveys are conducted only in June (numbers from August surveys were not used because the area surveyed was not provided), so it does not account for seasonal variations in distribution or habitat use of each species.

Table 5 in SAE's application provides a summary of the results of NMFS aerial survey data collected in June from 2000 to 2012. To estimate density of marine mammals, total number of individuals (other species) observed for the entire survey area by year (surveys usually last several days) was divided by the approximate total area surveyed for each year (density = individuals/km^2). As noted previously, the total number of animals observed for the entire survey includes both lower and upper Cook Inlet, so the total number reported and used to calculate density is higher than the number of marine mammals anticipated to be observed in the project area. In particular, the total number of harbor seals observed on several surveys is very high due to several large haul outs in lower and middle Cook Inlet. The table below (Table 2) provides average density estimates for gray whales, harbor seals, harbor porpoises, killer whales, and Steller sea lions over the 2000–2012 period.

TABLE 2—ANIMAL DENSITIES IN COOK INLET

Species	Average density (animals/km^2)
Humpback whale	0.0024
Gray whale	9.45E–05
Minke whale	1.14E–05
Killer whale	0.0008
Dall's porpoise	0.0002
Harbor porpoise	0.0033
Harbor seal	0.28
Steller sea lion	0.008

Calculation of Takes by Harassment

1. Beluga Whales

As a result of discussions with NMFS, SAE has used the NMML model (Goetz *et al.,* 2012a) for the estimate of takes in this proposed authorization. SAE has established two zones (Zone 1 and Zone 2) and proposes to conduct seismic surveys within all, or part of these zones; to be determined as weather, ice, and priorities dictate, which can be found in the attached figure which will be posted at *http://www.nmfs.noaa.gov/pr/permits/incidental/oilgas.htm.*

Based on information using Goetz *et al.* model(2012a), SAE derived one density estimate for beluga whales in Upper Cook Inlet (*i.e.,* north of the Forelands) and another density estimate for beluga whales in Lower Cook Inlet (*i.e.,* south of the Forelands). The density estimate for Upper Cook Inlet is 0.0212 and is 0.0056 for Lower Cook Inlet. SAE's seismic operational area would be determined as weather, ice, and priorities dictate. SAE has requested a maximum allowed take for Cook Inlet beluga whales of 30 individuals. SAE would operate in a portion of the total seismic operation area of 3,934 km^2 (1,519 mi^2), such that when one multiplies the anticipated beluga whale density based on the seismic survey operational area times the area to be ensonified to the 160-dB isopleth of 9.5 km (5.9 mi) and takes the number of days into consideration, estimated takes will not exceed 30 beluga whales.

In order to estimate when that level is reached, SAE is using a formula based on the total potential area of each seismic survey project zone (including

the 160 dB buffer) and the average density of beluga whales for each zone. Daily take is calculated as the product of a daily ensonified area times the density in that area. Then daily take is summed across all the days of the survey until the survey approaches 30 takes.

TABLE 3—EXPECTED BELUGA WHALE TAKES, TOTAL AREA OF ZONE, AND AVERAGE BELUGA WHALE DENSITY ESTIMATES

	Expected Beluga takes from NMML model (including the 160 dB buffer)	Total area of zone (km^2) (including the 160 dB buffer)	Average take density (dx)
Zone 1—Upper Inlet	28	2,126	$d_1 = 0.0212$
Zone 2—Lower Inlet	29	1,808	$d_2 = 0.0056$

SAE will limit surveying in the proposed seismic survey area (Zones 1 and 2 presented in Figures 1 and 2 of SAE's application) to ensure a maximum of 30 beluga takes during the open water season. In order to ensure that SAE does not exceed 30 beluga whale takes, the following equation is being used:

$$\text{Equation 1: } d_1A_1 + d_2A_{2\ldots.} \leq 30 \text{ Beluga Takes}$$

$$* \ d_x = \frac{\text{Expected Beluga Density from the NMML model in Zone X}}{\text{Total Area of Zone X including 160 dB buffer}}$$

$$* \ A_x = \text{Actual Area Surveyed } (km^2) \text{ including 160 dB buffer in Zone X}$$

This formula also allows SAE to have flexibility to prioritize survey locations in response to local weather, ice, and operational constraints. SAE may choose to survey portions of a zone or a zone in its entirety, and the analysis in this proposed authorization takes this into account. Using this formula, if SAE surveys the entire area of Zone 1 (1,319 km^2), then essentially none of Zone 2 will be surveyed because the input in the calculation denoted by d_2A_2 would essentially need to be zero to ensure that the total allotted proposed take of beluga whales is not exceeded. The use of this formula will ensure that SAE's proposed seismic survey will not exceed 30 calculated beluga takes.

Operations are required to cease once SAE has conducted seismic data acquisition in an area where multiplying the applicable density by the total ensonified area out to the 160-dB isopleth equaled 30 beluga whales, using the equation provided above.

2. Other Marine Mammal Species

The estimated takes of other Cook Inlet marine mammals that may be potentially harassed during the seismic surveys was calculated by multiplying the following:

- Average density estimates (derived from NMFS aerial surveys from 2000–2012 and presented in Table 3 in this document)
- the area ensonified by levels ≥160 dB re μPa rms in one day (calculated using the total ensonified area per day of 414.92 km^2, which is derived by applying the buffer distance to the 160 dB isopleth to the area of 6 survey tracklines),
- the number of potential survey days (160).

This equation provides the number of instances of take that will occur in the duration of the survey, but overestimates the number of individual animals taken because not every exposure on every successive day is expected to be a new individual. Especially with resident species, re-exposures of individuals are expected across the months of the survey.

SAE anticipates that a crew will collect seismic data for 8–10 hours per day over approximately 160 days over the course of 8 to 9 months each year. It is assumed that over the course of these 160 days, no more than 777 km^2 will be surveyed in total, but areas can be surveyed more than once. It is important to note that environmental conditions (such as ice, wind, fog) will play a significant role in the actual operating days; therefore, these estimates are conservative in order to provide a basis for probability of encountering these marine mammal species in the project area.

As noted above, using the above method results in an accurate estimate of the instances of take, but likely significantly overestimates the number of individual animals expected to be taken. With most species, even this overestimated number is still very small, and additional analysis is not really necessary to ensure minor impacts. However, because of the number and density of harbor seals in the area, a more accurate understanding of the number of individuals likely taken is necessary to fully analyze the impacts and ensure that the total number of harbor seals taken is small. Montgomery *et al.* (2007) surveyed harbor seals in Cook Inlet from spring to fall and found Cook Inlet harbor seals show preference for haulouts away from anthropogenic disturbance and near abundant prey and deep water. In order to estimate the number of individual harbor seals likely taken, we multiplied the total ensonified area of the entire project (1,732 km^2) times the average harbor seal density from NMML surveys (2002–2012) to yield a snapshot abundance for the project area, which would represent the number of individuals taken in the project area if one assumed that no new individuals would enter the area during the duration of the project. Since, however, we do believe that some new individual harbor seals will enter the project area during the course of the surveys, this snapshot abundance was adjusted using the concept of turnover factors, from Wood *et al.* 2012, to account for new animals entering the survey area. Wood derived turnover factors in an open ocean setting, using 1.0 (no turnover) for resident populations, using a very specifically derived 2.5 factor for migratory species, and establishing a 1.25 factor for all other species. We did not use the turnover factor of 1 for harbor seals suggested by Wood, but rather considered a more conservative 2.5 to accommodate for the difference

between an ocean environment and the enclosed environment of the Inlet.

Summary of Proposed Level B Harassment Takes

Table 4 here outlines the density estimates used to estimate Level B harassment takes, the requested Level B harassment take levels, the abundance of each species in Cook Inlet, the percentage of each species or stock estimated to be taken, and current population trends.

TABLE 4—DENSITY ESTIMATES, PROPOSED LEVEL B HARASSMENT TAKE LEVELS, SPECIES OR STOCK ABUNDANCE, PERCENTAGE OF POPULATION PROPOSED TO BE TAKEN, AND SPECIES TREND STATUS

Species	Average density (#individuals/km^2)	Proposed Level B take	Abundance	Percentage of population	Trend
Beluga whale	Upper=0.0212 Lower=0.0056	30	312	9.6	Decreasing.
Humpback whale	0.0024	158	7,469	2.1	Southeast Alaska increasing.
Minke whale	1.14E–05	1	1,233	0.06	No reliable information.
Gray whale	5.33E–05	7	19,126	0.033	Stable/increasing.
Killer whale	0.00082	55	2,347 (resident) 345 (transient)	2.34 15.9	Resident stock possibly increasing Transient stock stable.
Harbor porpoise	0.0033	219	31,046	0.70	No reliable information.
Dall's porpoise	0.0002	14	83,400	0.016	No reliable information.
Harbor seal	0.28	1,223	22,900	5.34	Stable.
Steller sea lion	0.0082	542	45,649	1.19	Decreasing but with regional variability (some stable or increasing).

Analyses and Preliminary Determinations

Negligible Impact Analysis

Negligible impact is ''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'' (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.,* population-level effects). An estimate of the number of Level B harassment takes, alone, is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be ''taken'' through behavioral harassment, NMFS must consider other factors, such as the likely nature of any responses (their intensity, duration, etc.), the context of any responses (critical reproductive time or location, feeding, migration, etc.), as well as the number and nature of estimated Level A harassment takes, the number of estimated mortalities, effects on habitat, and the status of the species.

Given the proposed mitigation and related monitoring, no injuries or mortalities are anticipated to occur as a result of SAE's proposed seismic survey in Cook Inlet, and none are proposed to be authorized. Additionally, animals in the area are not expected to incur hearing impairment (*i.e.,* TTS or PTS) or non-auditory physiological effects. The number of takes that are anticipated and proposed to be authorized are expected to be limited to short-term Level B behavioral harassment. The seismic airguns do not operate continuously over a 24-hour period. Rather airguns are operational for a few hours at a time totaling about 10 hours a day.

Cook Inlet beluga whales, the western DPS of Steller sea lions, and Central North Pacific humpback whales are listed as endangered under the ESA. These stocks are also considered depleted under the MMPA. The estimated annual rate of decline for Cook Inlet beluga whales was 0.6 percent between 2002 and 2012. Steller sea lion trends for the western stock are variable throughout the region with some decreasing and others remaining stable or even indicating slight increases. The Central North Pacific population of humpbacks is known to be increasing, with different techniques predicting abundance increases between 4.9 to 7 percent annually. The other seven species that may be taken by harassment during SAE's proposed seismic survey program are not listed as threatened or endangered under the ESA nor as depleted under the MMPA.

Odontocete (including Cook Inlet beluga whales, killer whales, and harbor porpoises) reactions to seismic energy pulses are usually assumed to be limited to shorter distances from the airgun(s) than are those of mysticetes, in part because odontocete low-frequency hearing is assumed to be less sensitive than that of mysticetes. Belugas in the Canadian Beaufort Sea in summer appear to be fairly responsive to seismic energy, with few being sighted within 10–20 km (6–12 mi) of seismic vessels during aerial surveys (Miller *et al.,* 2005). However, as noted above, Cook Inlet belugas are more accustomed to anthropogenic sound than beluga whales in the Beaufort Sea. Therefore, the results from the Beaufort Sea surveys do not directly translate to potential reactions of Cook Inlet beluga whales. Also, due to the dispersed distribution of beluga whales in Cook Inlet during winter and the concentration of beluga whales in upper Cook Inlet from late April through early fall, belugas would likely occur in small numbers in the majority of SAE's proposed survey area during the majority of SAE's annual operational timeframe of April through December. For the same reason, as well as mitigation measures, it is unlikely that animals would be exposed to received levels capable of causing injury.

The addition of nine vessels, and noise due to vessel operations associated with the seismic survey, would not be outside the present experience of marine mammals in Cook Inlet, although levels may increase locally. Given the large number of vessels in Cook Inlet and the apparent habituation to vessels by Cook Inlet beluga whales and the other marine mammals that may occur in the area, vessel activity and noise is not expected to have effects that could cause significant or long-term consequences for individual marine mammals or their populations. Potential impacts to marine mammal habitat were discussed

previously in this document (see the ''Anticipated Effects on Habitat'' section). Although some disturbance is possible to food sources of marine mammals, the impacts are anticipated to be minor enough as to not affect annual rates of recruitment or survival of marine mammals in the area. Based on the size of Cook Inlet where feeding by marine mammals occurs versus the localized area of the marine survey activities, any missed feeding opportunities in the direct project area would be minor based on the fact that other feeding areas exist elsewhere. Taking into account the mitigation measures that are planned, effects on cetaceans are generally expected to be restricted to avoidance of a limited area around the survey operation and short-term changes in behavior, falling within the MMPA definition of ''Level B harassment''. Animals are not expected to permanently abandon any area that is surveyed, and any behaviors that are interrupted during the activity are expected to resume once the activity ceases. Only a small portion of marine mammal habitat will be affected at any time, and other areas within Cook Inlet will be available for necessary biological functions. In addition, NMFS proposes to seasonally restrict seismic survey operations in the area known to be important for beluga whale feeding, calving, or nursing. The primary location for these biological life functions occurs in the Susitna Delta region of upper Cook Inlet. NMFS proposes to implement a 16 km (10 mi) seasonal exclusion from seismic survey operations in this region from April 15–October 15. The highest concentrations of belugas are typically found in this area from early May through September each year. NMFS has incorporated a 2-week buffer on each end of this seasonal use timeframe to account for any anomalies in distribution and marine mammal usage.

Mitigation measures such as controlled vessel speed, dedicated marine mammal observers, speed and course alterations, and shutdowns or power downs when marine mammals are seen within defined ranges designed both to avoid injury and disturbance will further reduce short-term reactions and minimize any effects on hearing sensitivity. In all cases, the effects of the seismic survey are expected to be short-term, with no lasting biological consequence. Therefore, the exposure of cetaceans to SAE's proposed seismic survey activity, operation is not anticipated to have an effect on annual rates of recruitment or survival of the affected species or stocks, and therefore will have a negligible impact on them.

Some individual pinnipeds may be exposed to sound from the proposed seismic surveys more than once during the timeframe of the project. Taking into account the mitigation measures that are planned, effects on pinnipeds are generally expected to be restricted to avoidance of a limited area around the survey operation and short-term changes in behavior, falling within the MMPA definition of ''Level B harassment''. Animals are not expected to permanently abandon any area that is surveyed, and any behaviors that are interrupted during the activity are expected to resume once the activity ceases. Only a small portion of pinniped habitat will be affected at any time, and other areas within Cook Inlet will be available for necessary biological functions. In addition, the area where the survey will take place is not known to be an important location where pinnipeds haul out. The closest known haul-out site is located on Kalgin Island, which is about 22 km from the McArther River. More recently, some large congregations of harbor seals have been observed hauling out in upper Cook Inlet. However, mitigation measures, such as vessel speed, course alteration, and visual monitoring, and restrictions will be implemented to help reduce impacts to the animals. Therefore, the exposure of pinnipeds to sounds produced by this phase of SAE's proposed seismic survey is not anticipated to have an effect on annual rates of recruitment or survival on those species or stocks.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total annual marine mammal take from SAE's proposed seismic survey will have a negligible impact on the affected marine mammal species or stocks.

Small Numbers Analysis

The requested takes proposed to be authorized annually represent 9.6 percent of the Cook Inlet beluga whale population of approximately 312 animals (Allen and Angliss, 2014), 2.34 percent of the Alaska resident stock and 15.9 percent of the Gulf of Alaska, Aleutian Island and Bering Sea stock of killer whales (1,123 residents and 345 transients), 0.70 percent of the Gulf of Alaska stock of approximately 31,046 harbor porpoises, 2.1 percent of the 7,469 Central North Pacific humpback whales, 0.06 percent of the 1,233 Alaska minke whales, 0.016 percent of the 83,400 Gulf of Alaska Dall's porpoise, and 0.033 percent of the eastern North Pacific stock of approximately 19,126 gray whales. The take requests presented for harbor seals represent 5.34 percent of the Cook Inlet/Shelikof stock of approximately 22,900 animals. The requested takes proposed for Steller sea lions represent 1.19 percent of the U.S. portion of the western stock of approximately 45,649 animals. These take estimates represent the percentage of each species or stock that could be taken by Level B behavioral harassment.

NMFS finds that any incidental take reasonably likely to result from the effects of the proposed activity, as proposed to be mitigated through this IHA, will be limited to small numbers relative to the affected species or stocks. In addition to the quantitative methods used to estimate take, NMFS also considered qualitative factors that further support the ''small numbers'' determination, including: (1) The seasonal distribution and habitat use patterns of Cook Inlet beluga whales, which suggest that for much of the time only a small portion of the population would be accessible to impacts from SAE's activity, as most animals are found in the Susitna Delta region of Upper Cook Inlet from early May through September; (2) other cetacean species and Steller sea lions are not common in the seismic survey area; (3) the proposed mitigation requirements, which provide spatio-temporal limitations that avoid impacts to large numbers of belugas feeding and calving in the Susitna Delta and limit exposures to sound levels associated with Level B harassment; (4) the proposed monitoring requirements and mitigation measures described earlier in this document for all marine mammal species that will further reduce the amount of takes; and (5) monitoring results from previous activities that indicated low numbers of beluga whale sightings within the Level B disturbance exclusion zone and low levels of Level B harassment takes of other marine mammals. Therefore, NMFS determined that the numbers of animals likely to be taken are small.

Impact on Availability of Affected Species for Taking for Subsistence Uses

Relevant Subsistence Uses

The subsistence harvest of marine mammals transcends the nutritional and economic values attributed to the animal and is an integral part of the cultural identity of the region's Alaska Native communities. Inedible parts of the whale provide Native artisans with

materials for cultural handicrafts, and the hunting itself perpetuates Native traditions by transmitting traditional skills and knowledge to younger generations (NOAA, 2007).

The Cook Inlet beluga whale has traditionally been hunted by Alaska Natives for subsistence purposes. For several decades prior to the 1980s, the Native Village of Tyonek residents were the primary subsistence hunters of Cook Inlet beluga whales. During the 1980s and 1990s, Alaska Natives from villages in the western, northwestern, and North Slope regions of Alaska either moved to or visited the south central region and participated in the yearly subsistence harvest (Stanek, 1994). From 1994 to 1998, NMFS estimated 65 whales per year (range 21–123) were taken in this harvest, including those successfully taken for food and those struck and lost. NMFS concluded that this number was high enough to account for the estimated 14 percent annual decline in the population during this time (Hobbs *et al.,* 2008). Actual mortality may have been higher, given the difficulty of estimating the number of whales struck and lost during the hunts. In 1999, a moratorium was enacted (Pub. L. 106–31) prohibiting the subsistence take of Cook Inlet beluga whales except through a cooperative agreement between NMFS and the affected Alaska Native organizations. Since the Cook Inlet beluga whale harvest was regulated in 1999 requiring cooperative agreements, five beluga whales have been struck and harvested. Those beluga whales were harvested in 2001 (one animal), 2002 (one animal), 2003 (one animal), and 2005 (two animals). The Native Village of Tyonek agreed not to hunt or request a hunt in 2007, when no co-management agreement was to be signed (NMFS, 2008a).

On October 15, 2008, NMFS published a final rule that established long-term harvest limits on Cook Inlet beluga whales that may be taken by Alaska Natives for subsistence purposes (73 FR 60976). That rule prohibits harvest for a 5-year interval period if the average stock abundance of Cook Inlet beluga whales over the prior five-year interval is below 350 whales. Harvest levels for the current 5-year planning interval (2013–2017) are zero because the average stock abundance for the previous five-year period (2008–2012) was below 350 whales. Based on the average abundance over the 2002–2007 period, no hunt occurred between 2008 and 2012 (NMFS, 2008a). The Cook Inlet Marine Mammal Council, which managed the Alaska Native Subsistence fishery with NMFS, was disbanded by a unanimous vote of the Tribes' representatives on June 20, 2012. At this time, no harvest is expected in 2015 or, likely, in 2016.

Data on the harvest of other marine mammals in Cook Inlet are lacking. Some data are available on the subsistence harvest of harbor seals, harbor porpoises, and killer whales in Alaska in the marine mammal stock assessments. However, these numbers are for the Gulf of Alaska including Cook Inlet, and they are not indicative of the harvest in Cook Inlet.

There is a low level of subsistence hunting for harbor seals in Cook Inlet. Seal hunting occurs opportunistically among Alaska Natives who may be fishing or travelling in the upper Inlet near the mouths of the Susitna River, Beluga River, and Little Susitna River. Some data are available on the subsistence harvest of harbor seals, harbor porpoises, and killer whales in Alaska in the marine mammal stock assessments. However, these numbers are for the Gulf of Alaska including Cook Inlet, and they are not indicative of the harvest in Cook Inlet. Some detailed information on the subsistence harvest of harbor seals is available from past studies conducted by the Alaska Department of Fish & Game (Wolfe *et al.,* 2009). In 2008, 33 harbor seals were taken for harvest in the Upper Kenai-Cook Inlet area. In the same study, reports from hunters stated that harbor seal populations in the area were increasing (28.6%) or remaining stable (71.4%). The specific hunting regions identified were Anchorage, Homer, Kenai, and Tyonek, and hunting generally peaks in March, September, and November (Wolfe *et al.,* 2009).

Potential Impacts on Availability for Subsistence Uses

Section 101(a)(5)(D) also requires NMFS to determine that the taking will not have an unmitigable adverse effect on the availability of marine mammal species or stocks for subsistence use. NMFS has defined ''unmitigable adverse impact'' in 50 CFR 216.103 as an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

The primary concern is the disturbance of marine mammals through the introduction of anthropogenic sound into the marine environment during the proposed seismic survey. Marine mammals could be behaviorally harassed and either become more difficult to hunt or temporarily abandon traditional hunting grounds. However, the proposed seismic survey will not have any impacts to beluga harvests as none currently occur in Cook Inlet. Additionally, subsistence harvests of other marine mammal species are limited in Cook Inlet.

Plan of Cooperation or Measures To Minimize Impacts to Subsistence Hunts

Regulations at 50 CFR 216.104(a)(12) require IHA applicants for activities that take place in Arctic waters to provide a Plan of Cooperation or information that identifies what measures have been taken and/or will be taken to minimize adverse effects on the availability of marine mammals for subsistence purposes. The entire upper Cook unit and a portion of the lower Cook unit falls north of 60° N, or within the region NMFS has designated as an Arctic subsistence use area. There are several villages in SAE's proposed project area that have traditionally hunted marine mammals, primarily harbor seals. Tyonek is the only tribal village in upper Cook Inlet with a tradition of hunting marine mammals, in this case harbor seals and beluga whales. However, for either species the annual recorded harvest since the 1980s has averaged about one or fewer of either species (Fall *et al.* 1984, Wolfe *et al.* 2009, SRBA and HC 2011), and there is currently a moratorium on subsistence harvest of belugas. Further, many of the seals that are harvested are done incidentally to salmon fishing or moose hunting (Fall *et al.* 1984, Merrill and Orpheim 2013), often near the mouths of the Susitna Delta rivers (Fall *et al.* 1984) north of SAE's proposed seismic survey area.

Villages in lower Cook Inlet adjacent to SAE's proposed seismic area (Kenai, Salamatof, and Ninilchik) have either not traditionally hunted beluga whales, or at least not in recent years, and rarely do they harvest sea lions. Between 1992 and 2008, the only reported sea lion harvests from this area were two Steller sea lions taken by hunters from Kenai (Wolfe *et al.* 2009). These villages more commonly harvest harbor seals, with Kenai reporting an average of about 13 per year between 1992 and 2008 (Wolfe *et al.* 2008). According to Fall *et al.* (1984), many of the seals harvested by hunters from these villages were taken on the west side of the inlet during hunting excursions for moose and black

bears (or outside SAE's lower Cook unit).

Although marine mammals remain an important subsistence resource in Cook Inlet, the number of animals annually harvested are low, and are primarily harbor seals. Much of the harbor seal harvest occurs incidental to other fishing and hunting activities, and at areas outside of the SAE's proposed seismic areas such as the Susitna Delta or the west side of lower Cook Inlet. Also, SAE is unlikely to conduct seismic activity in the vicinity of any of the river mouths where large numbers of seals haul out.

SAE has identified the following features that are intended to reduce impacts to subsistence users:

• In-water seismic activities will follow mitigation procedures to minimize effects on the behavior of marine mammals and, therefore, opportunities for harvest by Alaska Native communities.

SAE and NMFS recognize the importance of ensuring that ANOs and federally recognized tribes are informed, engaged, and involved during the permitting process and will continue to work with the ANOs and tribes to discuss operations and activities.

Prior to offshore activities SAE will consult with nearby communities such as Nikiski, Tyonek, Ninilchik, Anchor point. SAE plans to attend and present the program description to the different groups listed in Section 3 prior to operations within those areas. During these meetings discussions will include our project description, maps of project area and resolutions of potential conflicts. These meetings will allow SAE to understand community concerns, and requests for communication or mitigation. Additional communications will continue throughout the project. Meetings will also be held with Native Corporation leaders to establish subsistence activities and timelines. Ongoing discussions and meeting with federal and state agencies during the permit process.

A specific meeting schedule has not been finalized, but meetings with the entities identified in Section 3 will occur between December 2014 and March 2015.

SAE will document results of all meetings and incorporate to mitigate concerns into the Plan of Cooperation (POC). There shall be a review of permit stipulations and a permit matrix developed for the crews. The means of communications and contacts list will be developed and implemented into the project. The use of PSOs/MMO's on board the vessels will ensure that appropriate precautions are taken to avoid harassment of marine mammals.

If a conflict does occur with project activities involving subsistence or fishing, the project manager will immediately contact the affected party to resolve the conflict. If avoidance is not possible, the project manager will initiate communication with the Operations Supervisor to resolve the issue and plan an alternative course of action. The communications will involve the Permits Manager and the Anchorage Office of SAE.

Unmitigable Adverse Impact Analysis and Preliminary Determination

The project will not have any effect on beluga whale harvests because no beluga harvest will take place in 2015. Additionally, the proposed seismic survey area is not an important native subsistence site for other subsistence species of marine mammals, and Cook Inlet contains a relatively small proportion of marine mammals utilizing Cook Inlet; thus, the number harvested is expected to be extremely low. The timing and location of subsistence harvest of Cook Inlet harbor seals may coincide with SAE's project, but because this subsistence hunt is conducted opportunistically and at such a low level (NMFS, 2013c), SAE's program is not expected to have an impact on the subsistence use of harbor seals. Moreover, the proposed survey would result in only temporary disturbances. Accordingly, the specified activity would not impact the availability of these other marine mammal species for subsistence uses.

NMFS anticipates that any effects from SAE's proposed seismic survey on marine mammals, especially harbor seals and Cook Inlet beluga whales, which are or have been taken for subsistence uses, would be short-term, site specific, and limited to inconsequential changes in behavior and mild stress responses. NMFS does not anticipate that the authorized taking of affected species or stocks will reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (1) Causing the marine mammals to abandon or avoid hunting areas; (2) directly displacing subsistence users; or (3) placing physical barriers between the marine mammals and the subsistence hunters; and that cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met. Based on the description of the specified activity, the measures described to minimize adverse effects on the availability of marine mammals for subsistence purposes, and the proposed mitigation and monitoring measures, NMFS has preliminarily determined that there will not be an unmitigable adverse impact on subsistence uses from SAE's proposed activities.

Endangered Species Act (ESA)

There are three marine mammal species listed as endangered under the ESA with confirmed or possible occurrence in the proposed project area: the Cook Inlet beluga whale, the western DPS of Steller sea lion, and the Central North Pacific humpback whale. In addition, the proposed action could occur within 10 miles of designated critical habitat for the Cook Inlet beluga whale. NMFS's Permits and Conservation Division has initiated consultation with NMFS' Alaska Region Protected Resources Division under section 7 of the ESA. This consultation will be concluded prior to issuing any final authorization.

National Environmental Policy Act (NEPA)

NMFS has prepared a Draft Environmental Assessment (EA) for the issuance of an IHA to SAE for the proposed oil and gas exploration seismic survey program in Cook Inlet. The Draft EA has been made available for public comment concurrently with this proposed authorization (see **ADDRESSES**). NMFS will finalize the EA and either conclude with a finding of no significant impact (FONSI) or prepare an Environmental Impact Statement prior to issuance of the final authorization (if issued).

Proposed Authorization

As a result of these preliminary determinations, we propose to issue an IHA to SAExploration Inc. for taking marine mammals incidental to a seismic survey in Cook Inlet, Alaska, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. The proposed IHA language is provided next.

This section contains a draft of the IHA itself. The wording contained in this section is proposed for inclusion in the IHA (if issued).

Request for Public Comments

We request comment on our analysis, the draft authorization, and any other aspect of the Notice of Proposed IHA for SAExploration Inc. Please include with your comments any supporting data or literature citations to help inform our final decision on SAE's request for an MMPA authorization.

Incidental Harassment Authorization

SAExploration Inc. (SAE), 8240 Sandlewood Place, Anchorage, Alaska 99507, is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA; 16 U.S.C. 1371(a)(5)(D)), to harass small numbers of marine mammals incidental to specified activities associated with a marine geophysical (seismic) survey in Cook Inlet, Alaska, contingent upon the following conditions:

1. This Authorization is valid from April 1, 2015, through December 31, 2015.

2. This Authorization is valid only for SAE's activities associated with seismic survey operations that shall occur within the areas denoted as Zone 1 and Zone 2 as depicted in the attached Figures 1 and 2 of SAE's January 2015 application to the National Marine Fisheries Service.

3. *Species Authorized and Level of Take*

(a) The incidental taking of marine mammals, by Level B harassment only, is limited to the following species in the waters of Cook Inlet:

(i) Odontocetes: See Table 1 (attached) for authorized species and take numbers.

(ii) Pinnipeds: See Table 1 (attached) for authorized species and take numbers.

(iii) If any marine mammal species are encountered during seismic activities that are not listed in Table 1 (attached) for authorized taking and are likely to be exposed to sound pressure levels (SPLs) greater than or equal to 160 dB re 1 µPa (rms), then the Holder of this Authorization must alter speed or course, power down or shut-down the sound source to avoid take.

(b) The taking by injury (Level A harassment) serious injury, or death of any of the species listed in Table 1 or the taking of any kind of any other species of marine mammal is prohibited and may result in the modification, suspension or revocation of this Authorization.

(c) If the number of detected takes of any marine mammal species listed in Table 1 is met or exceeded, SAE shall immediately cease survey operations involving the use of active sound sources (*e.g.,* airguns and pingers) and notify NMFS.

4. The authorization for taking by harassment is limited to the following acoustic sources (or sources with comparable frequency and intensity) absent an amendment to this Authorization:

(a) Two airgun arrays, each with a capacity of 880 in^3;

(b) A 440 in^3 airgun array;

(c) A 10 in^3 airgun;

(d) A Scott Ultra-Short Baseline (USBL) transceiver; and

(e) A Sonardyne TZ/OBC transponder.

5. The taking of any marine mammal in a manner prohibited under this Authorization must be reported immediately to the Chief, Permits and Conservation Division, Office of Protected Resources, NMFS or her designee at (301) 427–8401.

6. The holder of this Authorization must notify the Chief of the Permits and Conservation Division, Office of Protected Resources, or her designee at least 48 hours prior to the start of seismic survey activities (unless constrained by the date of issuance of this Authorization in which case notification shall be made as soon as possible) at 301–427–8484 or to *Sara.Young@noaa.gov.*

7. *Mitigation and Monitoring Requirements:* The Holder of this Authorization is required to implement the following mitigation and monitoring requirements when conducting the specified activities to achieve the least practicable impact on affected marine mammal species or stocks:

(a) Utilize a sufficient number of NMFS-qualified, vessel-based Protected Species Visual Observers (PSVOs) (except during meal times and restroom breaks, when at least one PSVO shall be on watch) to visually watch for and monitor marine mammals near the seismic source vessels during daytime operations (from nautical twilight-dawn to nautical twilight-dusk) and before and during start-ups of sound sources day or night. Two PSVOs will be on each source vessel, and two PSVOs will be on the support vessel to observe the exclusion and disturbance zones. PSVOs shall have access to reticle binoculars (7x50) and long-range binoculars (40x80). PSVO shifts shall last no longer than 4 hours at a time. PSVOs shall also make observations during daytime periods when the sound sources are not operating for comparison of animal abundance and behavior, when feasible. When practicable, as an additional means of visual observation, SAE's vessel crew may also assist in detecting marine mammals.

(b) In addition to the vessel-based PSVOs, utilize a shore-based station to visually monitor for marine mammals. The shore-based station will follow all safety procedures, including bear safety. The location of the shore-based station will need to be sufficiently high to observe marine mammals; the PSOs would be equipped with reticle binoculars (7x50) and long-range binoculars (40x80). The shore-based PSOs would scan the area prior to, during, and after the survey operations involving the use of sound sources, and would be in contact with the vessel-based PSOs via radio to communicate sightings of marine mammals approaching or within the project area.

(c) Record the following information when a marine mammal is sighted:

(i) Species, group size, age/size/sex categories (if determinable), behavior when first sighted and after initial sighting, heading (if consistent), bearing and distance from seismic vessel, sighting cue, apparent reaction to the airguns or vessel (*e.g.,* none, avoidance, approach, paralleling, etc., and including responses to ramp-up), and behavioral pace;

(ii) Time, location, heading, speed, activity of the vessel (including number of airguns operating and whether in state of ramp-up or power-down), Beaufort sea state and wind force, visibility, and sun glare; and

(iii) The data listed under Condition 7(d)(ii) shall also be recorded at the start and end of each observation watch and during a watch whenever there is a change in one or more of the variables.

(d) Establish a 180 dB re 1 µPa (rms) and 190 dB re 1 µPa (rms) ''exclusion zone'' (EZ) for cetaceans and pinnipeds respectively before the full array (2400 in^3) is in operation; and a 180 dB re 1 µPa (rms) and 190 dB re 1 µPa (rms) EZ before a single airgun (10 in^3) is in operation, respectively.

(e) Visually observe the entire extent of the EZ (180 dB re 1 µPa [rms] for cetaceans and 190 dB re 1 µPa [rms] for pinnipeds) using NMFS-qualified PSVOs, for at least 30 minutes (min) prior to starting the airgun array (day or night). If the PSVO finds a marine mammal within the EZ, SAE must delay the seismic survey until the marine mammal(s) has left the area. If the PSVO sees a marine mammal that surfaces, then dives below the surface, the PSVO shall wait 30 min. If the PSVO sees no marine mammals during that time, they should assume that the animal has moved beyond the EZ. If for any reason the entire radius cannot be seen for the entire 30 min (*i.e.,* rough seas, fog, darkness), or if marine mammals are near, approaching, or in the EZ, the airguns may not be ramped-up.

(f) Implement a ''ramp-up'' procedure when starting up at the beginning of seismic operations or any time after the entire array has been shut down for more than 10 min, which means start the smallest sound source first and add sound sources in a sequence such that the source level of the array shall increase in steps not exceeding

approximately 6 dB per 5-min period. During ramp-up, the PSVOs shall monitor the EZ, and if marine mammals are sighted, a power-down, or shutdown shall be implemented as though the full array were operational. Therefore, initiation of ramp-up procedures from shutdown requires that the PSVOs be able to visually observe the full EZ as described in Condition 7(e) (above).

(g) Alter speed or course during seismic operations if a marine mammal, based on its position and relative motion, appears likely to enter the relevant EZ. If speed or course alteration is not safe or practicable, or if after alteration the marine mammal still appears likely to enter the EZ, further mitigation measures, such as a power-down or shutdown, shall be taken.

(h) Power-down or shutdown the sound source(s) if a marine mammal is detected within, approaches, or enters the relevant EZ. A shutdown means all operating sound sources are shut down (*i.e.,* turned off). A power-down means reducing the number of operating sound sources to a single operating 10 in^3 airgun, which reduces the EZ to the degree that the animal(s) is no longer in or about to enter it.

(i) Following a power-down, if the marine mammal approaches the smaller designated EZ, the sound sources must then be completely shut down. Seismic survey activity shall not resume until the PSVO has visually observed the marine mammal(s) exiting the EZ and is not likely to return, or has not been seen within the EZ for 15 min for species with shorter dive durations (small odontocetes and pinnipeds) or 30 min for species with longer dive durations (large odontocetes, including killer whales and beluga whales).

(j) Following a power-down or shutdown and subsequent animal departure, survey operations may resume following ramp-up procedures described in Condition 7(g).

(k) Marine geophysical surveys may continue into night and low-light hours if such segment(s) of the survey is initiated when the entire relevant EZs can be effectively monitored visually (*i.e.,* PSVO(s) must be able to see the extent of the entire relevant EZ).

(l) No initiation of survey operations involving the use of sound sources is permitted from a shutdown position at night or during low-light hours (such as in dense fog or heavy rain).

(m) If a beluga whale is visually sighted approaching or within the 160-dB disturbance zone, survey activity will not commence or the sound source(s) shall be shut down until the animals are no longer present within the 160-dB zone.

(n) Whenever aggregations or groups of killer whales and/or harbor porpoises are detected approaching or within the 160-dB disturbance zone, survey activity will not commence or the sound source(s) shall be shut-down until the animals are no longer present within the 160-dB zone. An aggregation or group of whales/porpoises shall consist of five or more individuals of any age/sex class.

(o) SAE must not operate airguns within 10 miles (16 km) of the mean higher high water (MHHW) line of the Susitna Delta (Beluga River to the Little Susitna River) between April 15 and October 15 (to avoid any effects to belugas in an important feeding and breeding area).

(p) Seismic survey operations involving the use of airguns and pingers must cease if takes of any marine mammal are met or exceeded.

(q) The mitigation airgun will be operated at approximately one shot per minute and will not be operated for longer than three hours in duration during daylight hours and good visibility. In cases when the next start-up after the turn is expected to be during lowlight or low visibility, use of the mitigation airgun may be initiated 30 minutes before darkness or low visibility conditions occur and may be operated until the start of the next seismic acquisition line.

8. *Reporting Requirements:* The Holder of this Authorization is required to:

(a) Submit a weekly field report, no later than close of business (Alaska time) each Thursday during the weeks when in-water seismic survey activities take place. The field reports will summarize species detected, in-water activity occurring at the time of the sighting, behavioral reactions to in-water activities, and the number of marine mammals taken.

(b) Submit a monthly report, no later than the 15th of each month, to NMFS' Permits and Conservation Division for all months during which in-water seismic survey activities occur. These reports must contain and summarize the following information:

(i) Dates, times, locations, heading, speed, weather, sea conditions (including Beaufort sea state and wind force), and associated activities during all seismic operations and marine mammal sightings;

(ii) Species, number, location, distance from the vessel, and behavior of any marine mammals, as well as associated seismic activity (number of power-downs and shutdowns), observed throughout all monitoring activities;

(iii) An estimate of the number (by species) of: (A) Pinnipeds that have been exposed to the seismic activity (based on visual observation) at received levels greater than or equal to 160 dB re 1 μPa (rms) and/or 190 dB re 1 μPa (rms) with a discussion of any specific behaviors those individuals exhibited; and (B) cetaceans that have been exposed to the seismic activity (based on visual observation) at received levels greater than or equal to 160 dB re 1 μPa (rms) and/or 180 dB re 1 μPa (rms) with a discussion of any specific behaviors those individuals exhibited.

(iv) A description of the implementation and effectiveness of the: (A) Terms and conditions of the Biological Opinion's Incidental Take Statement (ITS); and (B) mitigation measures of this Authorization. For the Biological Opinion, the report shall confirm the implementation of each Term and Condition, as well as any conservation recommendations, and describe their effectiveness, for minimizing the adverse effects of the action on Endangered Species Act-listed marine mammals.

(c) Submit a draft Technical Report on all activities and monitoring results to NMFS' Permits and Conservation Division within 90 days of the completion of the seismic survey. The Technical Report will include the following information:

(i) Summaries of monitoring effort (*e.g.,* total hours, total distances, and marine mammal distribution through the study period, accounting for sea state and other factors affecting visibility and detectability of marine mammals);

(ii) Analyses of the effects of various factors influencing detectability of marine mammals (*e.g.,* sea state, number of observers, and fog/glare);

(iii) Species composition, occurrence, and distribution of marine mammal sightings, including date, water depth, numbers, age/size/gender categories (if determinable), group sizes, and ice cover;

(iv) Analyses of the effects of survey operations; and

(v) Sighting rates of marine mammals during periods with and without seismic survey activities (and other variables that could affect detectability), such as: (A) Initial sighting distances versus survey activity state; (B) closest point of approach versus survey activity state; (C) observed behaviors and types of movements versus survey activity state; (D) numbers of sightings/individuals seen versus survey activity state; (E) distribution around the source vessels versus survey activity state; and (F) estimates of take by Level B harassment based on presence in the 160 dB harassment zone.

(d) Submit a final report to the Chief, Permits and Conservation Division, Office of Protected Resources, NMFS, within 30 days after receiving comments from NMFS on the draft report. If NMFS decides that the draft report needs no comments, the draft report shall be considered to be the final report.

(e) SAE must immediately report to NMFS if 25 belugas are detected within the 160 dB re 1 μPa (rms) disturbance zone during seismic survey operations to allow NMFS to consider making necessary adjustments to monitoring and mitigation.

9. (a) In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this Authorization, such as an injury (Level A harassment), serious injury or mortality (*e.g.,* ship-strike, gear interaction, and/or entanglement), SAE shall immediately cease the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, or her designees by phone or email (telephone: 301–427–8401 or *Sara.Young@noaa.gov*), the Alaska Regional Office (telephone: 907–271–1332 or *Barbara.Mahoney@noaa.gov*), and the Alaska Regional Stranding Coordinators (telephone: 907–586–7248 or *Aleria.Jensen@noaa.gov* or *Barbara.Mahoney@noaa.gov).* The report must include the following information:

(i) Time, date, and location (latitude/longitude) of the incident;

(ii) The name and type of vessel involved;

(iii) The vessel's speed during and leading up to the incident;

(iv) Description of the incident;

(v) Status of all sound source use in the 24 hours preceding the incident;

(vi) Water depth;

(vii) Environmental conditions (*e.g.,* wind speed and direction, Beaufort sea state, cloud cover, and visibility);

(viii) Description of marine mammal observations in the 24 hours preceding the incident;

(ix) Species identification or description of the animal(s) involved;

(x) The fate of the animal(s); and

(xi) Photographs or video footage of the animal (if equipment is available).

Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with SAE to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. SAE may not resume their activities until notified by NMFS via letter or email, or telephone.

(b) In the event that SAE discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.,* in less than a moderate state of decomposition as described in the next paragraph), SAE will immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, her designees, and the NMFS Alaska Stranding Hotline (see contact information in Condition 9(a)). The report must include the same information identified in the Condition 9(a) above. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with SAE to determine whether modifications in the activities are appropriate.

(c) In the event that SAE discovers an injured or dead marine mammal, and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in Condition 2 of this Authorization (*e.g.,* previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), SAE shall report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, her designees, the NMFS Alaska Stranding Hotline (1–877–925–7773), and the Alaska Regional Stranding Coordinators within 24 hours of the discovery (see contact information in Condition 9(a)). SAE shall provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network. Activities may continue while NMFS reviews the circumstances of the incident.

10. SAE is required to comply with the Reasonable and Prudent Measures and Terms and Conditions of the ITS corresponding to NMFS' Biological Opinion issued to both U.S. Army Corps of Engineers and NMFS' Office of Protected Resources.

11. A copy of this Authorization and the ITS must be in the possession of all contractors and PSOs operating under the authority of this Incidental Harassment Authorization.

12. Penalties and Permit Sanctions: Any person who violates any provision of this Incidental Harassment Authorization is subject to civil and criminal penalties, permit sanctions, and forfeiture as authorized under the MMPA.

13. This Authorization may be modified, suspended or withdrawn if the Holder fails to abide by the conditions prescribed herein or if the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals, or if there is an unmitigable adverse impact on the availability of such species or stocks for subsistence uses.

Donna S. Wieting, *Director, Office of Protected Resources National Marine Fisheries Service*

Date

TABLE 1—AUTHORIZED TAKE NUMBERS FOR EACH MARINE MAMMAL SPECIES IN COOK INLET

Species	Authorized take in the Cook Inlet action area
Mysticetes	
Humpback whale (*Megaptera novaeangliae*)	158
Gray whale (*Eschrichtius robustus*)	7
Minke whale (*Balaenoptera acutorostra*)	1
Odontocetes	
Dall's porpoise (*Phocoenoides dalli*)	14
Beluga whale (*Delphinapterus leucas*)	30
Killer whale (*Orcinus orca*)	55
Harbor porpoise (*Phocoena phocoena*)	219
Pinnipeds	
Steller sea lion (*Eumetopias jubatus*)	542
Harbor seal (*Phoca vitulina richardsi*)	1,223

Dated: March 16, 2015.

Donna S. Wieting,

Director, Office of Protected Resources, National Marine Fisheries Service.

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DEPARTMENT OF COMMERCE

Foreign-Trade Zones Board

[Order No. 1965]

Reorganization of Foreign-Trade Zone 104 (Expansion of Service Area) Under Alternative Site Framework; Savannah, Georgia

Pursuant to its authority under the Foreign-Trade Zones Act of June 18, 1934, as amended (19 U.S.C. 81a–81u), the Foreign-Trade Zones Board (the Board) adopts the following Order: