

DEPARTMENT OF THE INTERIOR**Fish and Wildlife Service****50 CFR Part 18**[Docket No. FWS-R7-ES-2019-0012;
FXES111607MRG01-190-FF07CAMM00]

RIN 1018-BD63

**Marine Mammals; Incidental Take
During Specified Activities: Cook Inlet,
Alaska****AGENCY:** Fish and Wildlife Service,
Interior.**ACTION:** Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service, in response to a request from Hilcorp Alaska, LLC, Harvest Alaska, LLC, and the Alaska Gasline Development Corporation, finalize regulations authorizing the nonlethal, incidental take by harassment of small numbers of northern sea otters in State and Federal waters (Alaska and the Outer Continental Shelf) within Cook Inlet, Alaska, as well as all adjacent rivers, estuaries, and coastal lands. Take may result from oil and gas exploration, development, production, and transportation activities occurring for a period of 5 years. This rule authorizes take by harassment only; no lethal take is authorized. We will issue Letters of Authorization, upon request, for specific proposed activities in accordance with these regulations. Additionally, the Office of Management and Budget has approved a revision of the existing Information Collection control number 1018-0070, for incidental take of marine mammals in the Beaufort and Chukchi Seas, to include oil and gas activities in Cook Inlet.

DATES: This rule is effective August 1, 2019, and remains effective through August 1, 2024.

ADDRESSES: *Document availability:* You may view this rule, the original and updated application packages, supporting information, final environmental assessment and U.S. Fish and Wildlife Service finding of no significant impact (FONSI), and the list of references cited herein at <http://www.regulations.gov> under Docket No. FWS-R7-ES-2019-0012, or these documents may be requested as described under **FOR FURTHER INFORMATION CONTACT**.

FOR FURTHER INFORMATION CONTACT: Mr. Christopher Putnam, U.S. Fish and Wildlife Service, MS 341, 1011 East Tudor Road, Anchorage, Alaska 99503, by email at fw7_ak_marine_mammals@fws.gov, or by telephone at 1-800-362-

5148. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Relay Service (FRS) at 1-800-877-8339, 24 hours a day, 7 days a week.

For information on Information Collection control number 1018-0070, contact the Service Information Collection Clearance Officer, U.S. Fish and Wildlife Service, MS: BPHC, 5275 Leesburg Pike, Falls Church, VA 22041-3803 (mail); 703-358-2503 (telephone), or info_coll@fws.gov (email). Please include "1018-0070" in the subject line of your email request.

SUPPLEMENTARY INFORMATION:**Immediate Promulgation**

In accordance with 5 U.S.C. 553(d)(3), we find that we have good cause to make this rule effective less than 30 days after publication. Immediate promulgation of the rule will ensure that the applicant will implement mitigation measures and monitoring programs in the geographic region that reduce the risk of any lethal and nonlethal effects to sea otters by their activities.

Background

Section 101(a)(5)(A) of the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361(a)(5)(A)) (MMPA), gives the Secretary of the Interior (Secretary) the authority to allow the incidental, but not intentional, taking of small numbers of marine mammals in response to requests by U.S. citizens engaged in a specified activity in a specified region. The Secretary has delegated authority for implementation of the MMPA to the U.S. Fish and Wildlife Service (Service). According to the MMPA, the Service shall allow this incidental taking for a period of up to 5 years if we make findings that such taking: (1) Will affect only small numbers of individuals of these species or stocks; (2) will have no more than a negligible impact on these species or stocks; (3) will not have an unmitigable adverse impact on the availability of these species or stocks for taking for subsistence use by Alaska Natives; and (4) we issue an incidental take regulation (ITR) setting forth: (a) The permissible methods of taking, (b) the means of effecting the least practicable adverse impact on the species, their habitat, and the availability of the species for subsistence uses, and (c) the requirements for monitoring and reporting. If final regulations allowing such incidental taking are issued, we may then subsequently issue a letter of authorization (LOA), upon request, to authorize incidental take during the specified activities.

The term "take," as defined by the MMPA, means to harass, hunt, capture, or kill, or to attempt to harass, hunt, capture, or kill any marine mammal (16 U.S.C. 1362(13)). Harassment, as defined by the MMPA for non-military readiness activities, means any act of pursuit, torment, or annoyance that (i) has the potential to injure a marine mammal or marine mammal stock in the wild (the MMPA calls this "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 (the MMPA calls this "Level B harassment").

The terms "negligible impact," "small numbers," "unmitigable adverse impact," and "U.S. citizens," among others, are defined in title 50 of the Code of Federal Regulations at 50 CFR 18.27, the Service's regulations governing take of small numbers of marine mammals incidental to specified activities. "Negligible impact" is defined 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. "Small numbers" is defined as a portion of a marine mammal species or stock whose taking would have a negligible impact on that species or stock. However, we do not rely on that definition here, as it conflates the terms "small numbers" and "negligible impact," which we recognize as two separate and distinct requirements. Instead, in our small numbers determination, we evaluate whether the number of marine mammals likely to be taken is small relative to the size of the overall stock.

"Unmitigable adverse impact" is defined 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 term "least practicable adverse impact" is not defined in the MMPA or its enacting regulations. We ensure the least practicable adverse impact by requiring mitigation measures that are effective in reducing the impacts of the

proposed activities, but are not so restrictive as to make conducting the activities unduly burdensome or impossible to undertake and complete.

Implementation of the ITR will require information collection activities. The Office of Management and Budget has approved a revision of the existing Information Collection control number 1018-0070, for incidental take of marine mammals in the Beaufort and Chukchi Seas, to include oil and gas activities in Cook Inlet.

Summary of Request

On May 3, 2018, Hilcorp Alaska, LLC (Hilcorp), Harvest Alaska, LLC (Harvest), and the Alaska Gasline Development Corporation (AGDC), hereinafter referred to as the “applicant,” petitioned the Service to promulgate regulations pursuant to section 101(a)(5)(A) of the MMPA for the nonlethal, unintentional taking of small numbers of northern sea otters (*Enhydra lutris kenyoni*; hereafter “sea otters” or “otters,” unless otherwise indicated) incidental to oil and gas exploration, development, production, and transportation activities in Cook Inlet, Alaska, for a period of 5 years. On June 28, 2018, the applicant submitted an amended request providing additional project details. In March 2019, Hilcorp and Harvest notified the Service that three-dimensional (3D) seismic survey activities originally planned to begin in April 2019 would be delayed until fall 2019. In June 2019, AGDC, Hilcorp, and Harvest also provided an updated application package at the request of the Service. The updated application clarified project details and provided additional information where necessary to respond to questions and concerns raised by comments received during the public review of the proposed ITR. These updates and clarifications were minor and did not significantly change the analysis of effects or the estimates of take, and did not alter the conclusions regarding whether the planned activities would have a negligible impact on the stocks, would affect subsistence use, or would affect more than a small number of animals.

Summary of Changes From the Proposed ITR

In preparing this final regulation for the incidental take of sea otters, we reviewed and considered comments and information from the public on our proposed rule published in the **Federal Register** on March 19, 2019 (84 FR 10224), for which the comment period was extended by notice in the **Federal Register** on April 5, 2019 (84 FR 13603).

We also reviewed and considered comments and information from the public for our draft Environmental Assessment (EA). Based on those considerations, and the new information provided by the applicant, we are finalizing these regulations with the following changes from our proposed rule:

- Table 1 and table 3 were updated to reflect the most recent project details available from the applicant.
- The Description of Specified Activities and table 1 were appended to include redevelopment of existing wells at Granite Point.
- Mitigation measures were added or modified in § 18.137(b)(1)(ii), (b)(4)(ii), (b)(7)(ii), (b)(9), (c)(2), (c)(3), (e)(4), and § 18.140(b) of this final rule.
- The total estimated number of Level B takes was adjusted from 1,663 to 1,684 after the analysis was updated to reflect updates in the project plans.
- The duration of activities used in the estimation of take was adjusted to reflect the maximum number of days during which underwater work may generate noise above thresholds for take. The following adjustments were made: Vibratory sheet pile driving was adjusted from 5 to 20 days, Lower Cook Inlet (LCI) pipe driving was revised from 3 to 12 days, Trading Bay (TB) pipe driving was revised from 1.5 to 6 days, vertical seismic profiling (VSP) in LCI was changed from 2 to 8 days, VSP in TB was adjusted from 1 to 4 days, and use of water jets was increased from 10.5 to 21 days.
- The analyses of take tables were updated to remove tugs towing rigs and use of hydraulic grinders at the request of the applicant and after analysis of take using the updated duration for these sources indicated that take was unlikely.
- Field verifications of sound production during two-dimensional (2D) and 3D seismic surveys have been added to the required mitigation measures.
- A discussion of the alternative mitigation measures evaluated but not required has been added.
- Use of a mitigation gun was changed from required mitigation for 2D and 3D seismic surveys to a measure that may be required in LOAs issued under this ITR.
- Table 9 was added to clarify allocation of sea otter take by location of activity relative to the appropriate stock boundary.
- Total estimated Level A take was adjusted from three takes from the southcentral Alaska stock to one take from the southwest Alaska stock and two takes from the southcentral Alaska

stock. This change was made to correct an error in the proposed ITR.

- A mitigation measure was added requiring an applicant for an LOA to evaluate alternatives to pile-supported facilities and establishing that the Service may require sound-attenuation devices or alternatives to pile-supported designs.
- The Estimated Incidental Take section was updated to reflect changes to the analysis due to the updated project details and to provide additional clarity in the analysis methods used.
- The evaluation of impacts of the specified activities was modified throughout the document to focus on the total numbers of takes rather than the numbers of individual sea otters taken. This change was needed to ensure the estimates from the analysis were accurate and did not underestimate take.

Description of the Regulation

This regulation does not authorize the specified activities to be conducted by the applicant. Rather, it authorizes the nonlethal incidental, unintentional take of small numbers of sea otters associated with those planned activities based on standards set forth in the MMPA. The ITR includes: Permissible amounts and methods of nonlethal taking; measures to ensure the least practicable adverse impact on sea otters and their habitat; measures to avoid and reduce impacts to subsistence uses; and requirements for monitoring and reporting.

Description of the ITR Geographic Area

The geographic region of the ITR encompasses Cook Inlet, Alaska, south of a line from the Susitna River Delta to Point Possession (approximately 61°15'54" N, 150°41'07" W, to 61°02'19" N, 150°23'48" W, WGS 1984) and north of a line from Rocky Cove to Coal Cove (at approximately 59°25'56" N, 153°44'25" W and 59°23'48" N, 151°54'28" W WGS 1984), excluding Ursus Cove, Iniskin Bay, Iliamna Bay, and Tuxedni Bay (see Regulation Promulgation, § 18.131 Specified geographic region where this subpart applies). The ITR area includes all Alaska State waters and Outer Continental Shelf (OCS) Federal waters within this area as well as all adjacent rivers, estuaries, and coastal lands where sea otters may occur, unless explicitly excluded.

The geographical extent of the Cook Inlet ITR region is approximately 1.1 million hectares (ha) (2.7 million acres (ac)). For descriptive purposes, the specified area is organized into two marine areas within Cook Inlet: LCI (south of the Forelands to Homer) and

middle Cook Inlet (MCI; north of the Forelands to the Susitna River and Point Possession). Project sites within these general areas include TB, Granite Point, and the North Cook Inlet unit (NCI) in the MCI, and the Iniskin Peninsula and the OCS waters of LCI.

Description of Specified Activities

The specified activities (also “project activities” or “planned activities”) include work related to oil and gas exploration, development, production, transport, and the decommissioning of existing facilities conducted by the applicant within a 5-year period. Hilcorp and Harvest jointly plan to conduct the following activities: 2D and 3D seismic surveys in LCI; routine operations of, maintenance of,

redevelopment of, and production drilling from existing oil and gas facilities in MCI; geophysical and geohazard surveys in both regions; drilling of two to four exploration wells in OCS waters of LCI and one to three wells in MCI; construction of a dock facility in Chinitna Bay; and decommissioning of an existing facility at the Drift River Terminal in MCI. The following support activities will be conducted: Pipe and pile driving using both vibratory and impact hammers; VSP; and pipeline and platform maintenance. AGDC plans to install a natural gas pipeline from the west side of MCI to the east side of LCI and to construct processing and loading facilities on either side. These include a product loading facility (PLF) and

temporary and mainline materials offloading facilities (TMOF, MMOF, MOF). Support activities for AGDC will include pile driving, dredging, geophysical surveys, trenching, fill placement, and anchor handling. Hilcorp, Harvest, and AGDC will use vessels and aircraft to support the activities. Detailed descriptions of the planned work are provided in the applicant’s updated petition for incidental take regulations for oil and gas activities in Cook Inlet (June 2019), the stakeholder engagement plan (April 2018), and the marine mammal monitoring and mitigation plan (May 2018). These documents can be obtained from the locations described above in **ADDRESSES**. Table 1 summarizes the planned activities.

TABLE 1—SUMMARY OF PLANNED ACTIVITIES INCLUDED IN INCIDENTAL TAKE REGULATION PETITION

Project component name & location	Geographic region	Year(s) planned	Seasonal timing	Total anticipated duration (2019–2024)
Anchor Point 2D seismic survey	LCI, Anchor Point to Kasilof	2021 or 2022	April–October	30 days (10 days in water seismic).
OCS 3D seismic survey	LCI OCS	2019 or 2020	April–October	45–60 days.
OCS geohazard survey	LCI OCS	2019–2021	April–October	28 days.
OCS exploratory wells	LCI OCS	2020–2022	February–November	40–60 days per well, 2–4 wells per year.
Iniskin Peninsula exploration and development	LCI, west side	2020–2022	April–October	180 days.
Platform & pipeline maintenance	MCI	2019–2024	April–October	180 days per year.
NCI subsea well geohazard survey	MCI	2020	April–October	7 days.
NCI well abandonment activity	MCI	2020	April–October	90 days.
TB area geohazard survey	MCI	2020	April–October	14 days.
Granite Point development drilling	MCI	2019	June–October	120–150 days.
Drift River terminal decommissioning	LCI, west side	2020–2023	April–October	120 days.
Product loading facility pile driving	MCI	2021–2023	April–October	162 days.
Material offloading facilities dredging	MCI	2021–2022	April–October	360 days.
Material offloading facilities pile driving	MCI	2021–2022	April–October	482 days.
Trenching, pipelay, burial	MCI	2023–2024	April–October	360 days.
Pipelay anchor handling	MCI	2023–2024	April–October	76 days.

LCI = Lower Cook Inlet, MCI = Middle Cook Inlet, NCI = North Cook Inlet, TB = Trading Bay.

Description of Marine Mammals in the Specified Area

The northern sea otter is the only marine mammal under the Service’s jurisdiction that normally occupies Cook Inlet, Alaska. Sea otters in Alaska are composed of three stocks. Those in Cook Inlet belong to either the southwest Alaska stock or the southcentral Alaska stock, depending on whether they occur west or east of the center of Cook Inlet, respectively. A third stock occurs in southeast Alaska.

The southwest Alaska stock of the northern sea otter is the southwest distinct population segment (DPS), which was listed as threatened under the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531, *et seq.*) on August 9, 2005 (70 FR 46366). On October 8, 2009 (74 FR 51988), the Service finalized designation of 15,164 square kilometers (km²) (or 5,855 square miles (mi²)) of critical habitat for the Southwest DPS of sea otters. Critical

habitat occurs in nearshore marine waters ranging from the mean high-tide line seaward for a distance of 100 meters (m), or to a water depth of 20 m. Detailed information about the biology and conservation status of the listed DPS can be found at <https://www.fws.gov/alaska/fisheries/mmm/seaotters/otters.htm>. Stock assessment reports for each of the three stocks are available at <https://www.fws.gov/alaska/pages/marine-mammal-management>.

Sea otters may occur anywhere within the specified project area, other than upland areas, but are not usually found north of about 60°23’30” N. The number of sea otters in Cook Inlet was estimated from an aerial survey conducted by the Service in cooperation with the U.S. Geological Survey (USGS) in May 2017 (Garlich-Miller *et al.* 2018). The sea otter survey was conducted in all areas of Cook Inlet south of approximately 60°16’30” N within the 40-m (131-foot) depth contour, including Kachemak Bay in southeastern Cook Inlet and

Kamishak Bay in southwestern Cook Inlet. This survey was designed to estimate abundance in Cook Inlet while accounting for the variable densities and observability of sea otters in the region. Total abundance was estimated to be 19,889 sea otters (standard error = 2,988). Within the project area, the highest densities of sea otters were found in the outer Kamishak Bay area, with 3.5 otters per km², followed by the eastern shore of Cook Inlet with 1.7 otters per km².

Sea otters generally occur in shallow water near the shoreline. They are most commonly observed within the 40-m (131-ft) depth contour (USFWS 2014a, b), although they can be found in areas with deeper water. Depth is generally correlated with distance to shore, and sea otters typically remain within 1 to 2 kilometers (km) or 0.62 to 1.24 miles (mi) of shore (Riedman and Estes 1990). They tend to remain closer to shore during storms, and they venture farther

out during calm seas (Lensink 1962; Kenyon 1969).

Sea otters are non-migratory and generally do not disperse over long distances (Garshelis and Garshelis 1984). They usually remain within a few kilometers of their established feeding grounds (Kenyon 1981). Breeding males remain for all or part of the year in a breeding territory covering up to 1 km (0.62 mi) of coastline. Adult females have home ranges of approximately 8 to 16 km (5 to 10 mi), which may include one or more male territories. Juveniles move greater distances between resting and foraging areas (Lensink 1962; Kenyon 1969; Riedman and Estes 1990; Tinker and Estes 1996).

Although sea otters generally remain local to an area, they may shift home ranges seasonally, and are capable of long-distance travel. Otters in Alaska have shown daily movement distances greater than 3 km (1.9 mi) at speeds up to 5.5 km/hr (3.4 mi per hour) (Garshelis

and Garshelis 1984). In eastern Cook Inlet, large numbers of sea otters have been observed riding the incoming tide northward and returning on the outgoing tide, especially in August. They are presumably feeding along the eastern shoreline of Cook Inlet during the slack tides when the seas are calm, and they remain in Kachemak Bay during periods of less favorable weather (Gill *et al.* 2009; BlueCrest 2013). In western Cook Inlet, otters appear to move in and out of Kamishak Bay in response to seasonal changes in the presence of sea ice (Larned 2006).

Potential Effects of the Activities

Effects of Noise

The operations outlined in the Description of Specified Activities and Described in the applicant’s updated petition have the potential to result in take of sea otters by harassment from noise. Here we characterize “noise” as

sound released into the environment from human activities that exceeds ambient levels or interferes with normal sound production or reception by sea otters. The terms “acoustic disturbance” or “acoustic harassment” are disturbances or harassment events resulting from noise exposure. Potential effects of noise exposure are likely to depend on the distance of the otter from the sound source and the level of sound received by the otter. Project components most likely to cause acoustic disturbance are shown in table 2. Temporary disturbance or localized displacement reactions are the most likely to occur. With implementation of the mitigation and monitoring measures described in § 18.137 Mitigation, § 18.138 Monitoring, and § 18.139 Reporting requirements, no lethal take is anticipated, and take by harassment (Level A and Level B) is expected to be minimized to the greatest extent practicable.

TABLE 2—PROJECT COMPONENTS PLANNED BY HILCORP, HARVEST, AND ALASKA GASLINE DEVELOPMENT CORPORATION THAT PRODUCE NOISE CAPABLE OF CAUSING INCIDENTAL TAKE BY HARASSMENT OF NORTHERN SEA OTTERS

Project component name & location	Anticipated noise sources
Anchor Point 2D seismic survey	Marine: 1 source vessel with airgun, 1 node vessel; Onshore/Intertidal: Shot holes, tracked vehicles, helicopters.
OCS 3D seismic survey	1 source vessel with airguns, 1 support vessel, 1 or 2 chase vessels to maintain security around streamers, 1 or 2 mitigation vessels.
OCS geohazard survey	1 vessel with echosounders and/or subbottom profilers.
OCS exploratory wells	1 jack-up rig, drive pipe installation, support vessels, helicopters.
Iniskin Peninsula exploration and development Platform & pipeline maintenance	Construction of causeway, dredging, vessels.
NCI subsea well geohazard survey	Vessels, water jets, helicopters, and/or sub-bottom profilers.
NCI well abandonment activity	1 vessel with echosounders and/or subbottom profilers.
TB area geohazard survey	1 jack-up rig, support vessel, helicopters.
TB area exploratory wells	1 vessel with echosounders and/or subbottom profilers.
Drift River terminal decommissioning	1 jack-up rig, drive pipe installation, support vessels, helicopters. Vessels.

OCS = outer continental shelf, NCI = North Cook Inlet, TB = Trading Bay.

Noise Levels

Whether a specific noise source will affect a sea otter depends on several factors, including the distance between the animal and the sound source, the sound intensity, background noise levels, the noise frequency, the noise duration, and whether the noise is pulsed or continuous. The actual noise level perceived by individual sea otters will depend on distance to the source, whether the animal is above or below water, atmospheric and environmental conditions, as well as aspects of the noise emitted.

Noise levels herein are given in decibels referenced to 1 μPa (dB re: 1 μPa) for underwater sound. All dB levels are dB_{RMS} unless otherwise noted; dB_{RMS} refers to the root-mean-squared dB level, the square root of the average of the squared sound pressure level (SPL) typically measured over 1 second. Other important metrics include the sound exposure level (SEL; represented as dB re: 1 μPa²-s), which represents the total energy contained within a pulse and considers both intensity and duration of exposure, and the peak sound pressure (also referred to

as the zero-to-peak sound pressure or 0–p). Peak sound pressure is the maximum instantaneous sound pressure measurable in the water at a specified distance from the source and is represented in the same units as the RMS sound pressure. See Richardson *et al.* (1995), Götz *et al.* (2009), Hopp *et al.* (2012), Navy (2014), for descriptions of acoustical terms and measurement units in the context of ecological impact assessment. A summary of the noises produced by the various components of the planned activities is provided in tables 3 and 4.

TABLE 3—SUMMARY OF SOUND SOURCE LEVELS FOR THE PLANNED OIL AND GAS ACTIVITIES BY HILCORP/HARVEST ALASKA AND ALASKA GASLINE DEVELOPMENT CORPORATION (AGDC)

Applicant	Activity	Sound pressure levels (dB re 1 µPa)	Frequency	Reference
Hilcorp/Harvest Alaska, AGDC	General vessel operations	145–175 dB rms at 1 m	10–1,500 Hz	Richardson <i>et al.</i> 1995; Blackwell and Greene 2003; Ireland and Bisson 2016.
Hilcorp/Harvest Alaska, AGDC	General aircraft operations	100–124 dB rms at 1 m	<500 Hz	Richardson <i>et al.</i> 1995.
Hilcorp/Harvest Alaska	2D seismic survey (1,945 cui airgun).	217 dB peak at 100 m	<300 Hz	Austin and Warner 2013; 81 FR 47240 (July 20, 2016).
		185 dB SEL at 100 m		
		197 dB rms at 100 m		
Hilcorp/Harvest Alaska	3D seismic survey (1,945 cui airgun).	217 dB peak at 100 m	<300 Hz	Austin and Warner 2013; 81 FR 47240 (July 20, 2016).
		185 dB SEL at 100 m		
		197 dB rms at 100 m		
Hilcorp/Harvest Alaska	Geohazard surveys	210–220 dB rms at 1 m	Echosounders & side scan sonar: >200 kHz. High-resolution sub-bottom profiler: 2–24 kHz. Low-resolution sub-bottom profiler: 1–4 kHz.	Manufacturer specifications.
Hilcorp/Harvest Alaska	Exploratory drilling rig	137 dB rms at 1 m	<200 Hz	Marine Acoustics Inc. 2011.
Hilcorp/Harvest Alaska	Drive pipe installation	190 dB rms at 55 m	<500 Hz	Illingworth & Rodkin 2014.
Hilcorp/Harvest Alaska	Vertical seismic profiling	227 dB rms at 1 m	<500 Hz	Illingworth & Rodkin 2014.
Hilcorp/Harvest Alaska	Sub-bottom profiling	212 dB rms at 1 m	1–24 kHz	Manufacturer specifications.
Hilcorp/Harvest Alaska	Rock laying for Iniskin Peninsula causeway.	136–141 dB rms at 12–19 m ..	<500 Hz	URS 2007.
Hilcorp/Harvest Alaska	Vibratory sheet pile driving for Iniskin Peninsula causeway.	175 dB peak at 10 m	<100–2,500 Hz	Illingworth & Rodkin 2007.
		160 dB SEL at 10 m		
		160 dB rms at 10 m		
Hilcorp/Harvest Alaska	Offshore production platforms	97–111 dB rms at 0.3–19 km	<500 Hz	Blackwell and Greene 2003.
Hilcorp/Harvest Alaska	Water jet	176 dB rms at 1 m	500 Hz–2 kHz	Austin 2017.
Hilcorp/Harvest Alaska	Pingers	192 dB rms at 1 m	4–14 kHz	Manufacturer specifications.
AGDC	Dredging: Including Clamshell dredge, Winching in/out, Dumping into barge, Empty barge at placement site.	107–142.6 dB rms at 10 m	<2.5 kHz, broadband	Dickerson <i>et al.</i> 2001; URS 2007.
AGDC	Underwater trenching with backhoe in shallow water.	145 dB @ 10 m	<2.5 kHz, broadband	Greene <i>et al.</i> 2008.
AGDC	Anchor handling	188 dB rms @ 1 m	<2.5 kHz, broadband	LGL/JASCO/Greeneridge 2014.

SEL = sound exposure level.

TABLE 4—SUMMARY OF SOUND SOURCES OF PILE-DRIVING ACTIVITIES FOR ALASKA GASLINE DEVELOPMENT CORPORATION (AGDC) FROM ILLINGWORTH & RODKIN (2007).

Representative pile type and size	Hammer type	Sound pressure level (dB re 1 µPa)			Project pile type and size
		Peak	RMS	SEL	
24-inch sheet pile	Impact	205	190	180	Sheet pile.
24-inch sheet pile	Vibratory	175	160	160	Sheet pile.
24-inch steel pipe pile	Impact	207	194	178	18- and 24-inch piles.
60-inch steel shell pile	Impact	210	195	185	48- and 60-inch piles.
72-inch steel pipe piles	Vibratory	183	170	170	All size piles.

Sea Otter Hearing

Sound frequencies produced by the applicant’s survey and construction activities will fall within the hearing range of sea otters and therefore will be audible to animals. Controlled sound exposure trials on southern sea otters (*E. l. nereis*) indicate that hearing ability spans frequencies between 125 hertz (Hz) and 38 kilohertz (kHz) with best sensitivity between 1.2 and 27 kHz (Ghoul and Reichmuth 2014). Aerial and underwater audiograms for a captive adult male southern sea otter in the presence of ambient noise suggest the sea otter’s hearing was less sensitive to high-frequency (greater than 22 kHz)

and low-frequency (less than 2 kHz) sounds than terrestrial mustelids but similar to that of a sea lion (*e.g.*, *Zalophus californianus*). Dominant frequencies of southern sea otter vocalizations are between 3 and 8 kHz, with some energy extending above 60 kHz (McShane *et al.* 1995; Ghoul and Reichmuth 2012a).

Exposure to high levels of sound may cause changes in behavior, masking of communications, temporary changes in hearing sensitivity, discomfort, and physical or auditory injury. Species-specific criteria for preventing harmful exposures to sound have not been identified for sea otters. Thresholds

have been developed for other marine mammals, above which exposure is likely to cause behavioral disturbance and injuries (Southall *et al.* 2007; Finneran and Jenkins 2012; NMFS 2018a). Because sea otter hearing abilities and sensitivities have not been fully evaluated, we relied on the closest related proxy, California sea lions, to evaluate the potential effects of noise exposure. The California sea lion, an otariid pinniped, has a frequency range of hearing most similar to that of the southern sea otter (Ghoul and Reichmuth 2014) and provides the closest related proxy for which data are available. Sea otters and pinnipeds

share a common mammalian aural physiology (Echteler *et al.* 1994; Solntseva 2007). Both are adapted to amphibious hearing, and both use sound in the same way (primarily for communication rather than feeding).

Exposure Criteria

Noise exposure criteria have been established by the National Marine Fisheries Service (NMFS) for identifying underwater noise levels capable of causing Level A harassment (injury) of certain marine mammals, including otariid pinnipeds (NMFS 2018a). Sea otter-specific criteria have not been determined; however, because of their biological similarities, we assume that noise criteria developed by NMFS for injury for otariid pinnipeds will be a suitable surrogate for sea otter impacts as well. Those criteria are based on estimated levels of sound exposure capable of causing a permanent shift in sensitivity of hearing (*e.g.*, a permanent threshold shift (PTS) (NMFS 2018a)). PTS occurs when noise exposure causes hairs within the inner ear system to die.

NMFS' (2018a) criteria for sound exposure incorporate two metrics of exposure: The peak level of instantaneous exposure likely to cause PTS, and the cumulative sound exposure level during a 24-hour period (SEL_{cum}). They also include weighting adjustments for the sensitivity of different species to varying frequencies. PTS-based injury criteria were developed from theoretical extrapolation of observations of temporary threshold shifts (TTS) detected in lab settings during sound exposure trials. Studies were summarized by Finneran (2015). For otariid pinnipeds, PTS is predicted to occur at 232 dB peak or 203 dB SEL_{cum} for impulsive sound, or 219 dB SEL_{cum} for non-impulsive (continuous) sound.

NMFS' criteria for take by Level A harassment represents the best available information for predicting injury from exposure to underwater sound among pinnipeds, and in the absence of data specific to otters, we assume these criteria also represent appropriate exposure limits for Level A take of sea otters.

NMFS (2018a) criteria do not identify thresholds for avoidance of Level B take. For pinnipeds, NMFS has adopted a 160-dB threshold for Level B take from exposure to impulse noise and a 120-dB threshold for continuous noise (NMFS 1998; HESS 1999; NMFS undated). These thresholds were developed from observations of mysticete (baleen) whales responding to airgun operations (*e.g.*, Malme *et al.* 1983a, b; Richardson *et al.* 1986, 1995) and from equating

Level B take with noise levels capable of causing TTS in lab settings.

We have evaluated these thresholds and determined that the Level B threshold of 120 dB for non-impulsive noise is not applicable to sea otters. The 120-dB threshold is based on studies conducted by Malme *et al.* in the 1980s, during which gray whales were exposed to experimental playbacks of industrial noise. Based on the behavioral responses of gray whales to the playback of drillship noise during a study at St. Lawrence Island, Alaska, Malme *et al.* (1988) concluded that "exposure to levels of 120 dB or more would probably cause avoidance of the area by more than one-half of the gray whales." Sea otters do not usually occur at St. Lawrence Island, Alaska, but similar playback studies conducted off the coast of California (Malme 1983a, 1984) included a southern sea otter monitoring component (Riedman 1983, 1984). The 1983 and 1984 studies detected probabilities of avoidance in gray whales comparable to those reported in Malme *et al.* (1988), but there was no evidence of disturbance reactions or avoidance in southern sea otters.

The applicable Level B thresholds may also depend on the levels of background noise present and the frequencies generated. NMFS acknowledges that the 120-dB threshold may not be applicable if background noise levels are high (NMFS undated), which is the case in Cook Inlet, where ambient levels can often exceed 120 dB (Blackwell and Greene 2003).

Thresholds developed for one species may not be appropriate for another due to differences in their frequency sensitivities. Continuous sound sources associated with the planned activities include vibratory pile driving, vessel activities, use of a water jet, dredging, trenching, and anchor handling. These are expected to produce low-frequency broadband noise. For example, vibratory pile driving will generate sound with frequencies that are predominantly lower than 2 kHz, and with the greatest pressure spectral densities at frequencies below 1 kHz (Dahl *et al.* 2015). Sea otters are capable of hearing down to 125 Hz, but have relatively poor hearing sensitivity at frequencies below 2 kHz (Ghoul and Reichmuth 2014). During a project that occurred in Elkhorn Slough, California, sound levels ranging from approximately 135 to 165 dB during vibratory pile driving elicited no clear pattern of disturbance or avoidance among southern sea otters in areas exposed to these levels of underwater sound (ESNERR 2011). In contrast, gray whales are in the group of

marine mammals believed to be most sensitive to low-frequency sounds, with an estimated audible frequency range of approximately 10 Hz to 30 kHz (Finneran 2015). Given the different range of frequencies to which sea otters and gray whales are sensitive, the NMFS 120-dB threshold based on gray whale behavior is not useful for predicting sea otter behavioral responses to low-frequency sound.

Although no specific thresholds have been developed for sea otters, several alternative behavioral response thresholds have been developed for pinnipeds. Southall *et al.* (2007, 2019) assessed behavioral response studies, found considerable variability among pinnipeds, and determined that exposures between approximately 90 to 140 dB generally do not appear to induce strong behavioral responses in pinnipeds in water, but behavioral effects, including avoidance, become more likely in the range between 120 to 160 dB, and most marine mammals showed some, albeit variable, responses to sound between 140 to 180 dB. Wood *et al.* (2012) later adapted the approach identified in Southall *et al.* (2007) to develop a probabilistic scale for marine mammal taxa at which 10 percent, 50 percent, and 90 percent of individuals exposed are assumed to produce a behavioral response. For many marine mammals, including pinnipeds, these response rates were set at sound pressure levels of 140, 160, and 180 dB respectively.

Thresholds based on TTS have been used as a proxy for Level B harassment (*i.e.*, 70 FR 1871, January 11, 2005; 71 FR 3260, January 20, 2006; and 73 FR 41318, July 18, 2008). Southall *et al.* (2007) derived TTS thresholds for pinnipeds based on 212 dB peak and 171-dB SEL_{cum} . Kastak *et al.* (2005) found exposures resulting in TTS in pinnipeds ranging from 152 to 174 dB (183–206 dB SEL). Kastak *et al.* (2008) demonstrated a persistent TTS, if not a PTS, after 60 seconds of 184 dB SEL. Kastelein *et al.* (2012) found small but statistically significant TTSs at approximately 170 dB SEL (136 dB, 60 min) and 178 dB SEL (148 dB, 15 min). Finneran (2015) summarized these and other studies, and NMFS (2018a) has used the data to develop TTS threshold for otariid pinnipeds of 188 dB SEL_{cum} for impulsive sounds and 199 dB SEL_{cum} for non-impulsive sounds.

Based on the lack of a disturbance response or any other reaction by sea otters to the 1980s playback studies and the absence of a clear pattern of disturbance or avoidance behaviors attributable to underwater sound levels up to about 160 dB resulting from

vibratory pile driving and other sources of similar low-frequency broadband noise, we assume 120 dB is not an appropriate behavioral response threshold for sea otters exposed to continuous underwater noise. We assume, based on the work of NMFS (2018a), Southall *et al.* (2007, 2019), and others described here, that either a 160-dB threshold or a 199-dB SEL_{cum} threshold is likely to be the best predictor of Level B take of sea otters for continuous noise exposure, using southern sea otters and pinnipeds as a proxy, and based on the best available data. When behavioral observations during vibratory pile driving (ESNERR 2011) and results of behavioral response modelling (Wood *et al.* 2012) are

considered, the application of a 160-dB rms threshold is most appropriate. Exposure to impulsive sound levels greater than 160 dB can elicit behavioral changes in marine mammals that might be detrimental to health and long-term survival where it disrupts normal behavioral routines. Thus, using information available for other marine mammals as a surrogate, and taking into consideration the best available information about sea otters, the Service has set the received sound level under water of 160 dB as a threshold for Level B take by disturbance for sea otters for this ITR based on the work of Ghaul and Reichmuth (2012a, b), McShane *et al.* (1995), NOAA (2005), Riedman (1983), Richardson *et al.* (1995), and others. Exposure to unmitigated in-water noise levels between 125 Hz and 38 kHz that

are greater than 160 dB—for both impulsive and non-impulsive sound sources—will be considered by the Service as Level B take; thresholds for potentially injurious Level A take will be 232 dB peak or 203 dB SEL for impulsive sounds and 219 dB SEL for continuous sounds (table 5).

The area in which underwater noise in the frequency range of sea otter hearing will exceed thresholds, is termed the “area of ensonification” or “zone of ensonification.” The ensonification zone in which noise levels exceed thresholds for Level A take is often referred to as the Level A harassment zone. The Level B harassment zone likewise includes areas ensonified to thresholds for Level B take of sea otters.

TABLE 5—SUMMARY OF THRESHOLDS FOR PREDICTING LEVEL A AND LEVEL B TAKE OF NORTHERN SEA OTTERS FROM UNDERWATER SOUND EXPOSURE IN THE FREQUENCY RANGE 125

Marine mammals	Injury (Level A) threshold		Disturbance (Level B) threshold
	Impulsive ¹	Non-impulsive ¹	All
Sea otters	232 dB peak; 203 dB SEL _{CUM}	219 dB SEL _{CUM}	160 dB rms.

¹ Based on National Marine Fisheries Service acoustic exposure criteria for take of otariid pinnipeds (NMFS 2018a). SEL_{CUM} = cumulative sound exposure level.

Noise-Generating Activities

The components of the specified activities that have the greatest likelihood of exposing sea otters to underwater noise capable of causing Level A or Level B take include geophysical surveys, pile driving, drilling activities, and anchor handling associated with pipeline construction. Vessel and aircraft operations also have the ability to expose otters to sound that may cause disturbance. A brief description of potential impacts follows.

Geophysical Surveys—Airgun arrays used in seismic surveys to locate potential hydrocarbon-bearing geologic formations typically produce most noise energy in the 10- to 120-Hertz (Hz) range, with some energy extending to 1,000 Hz (Richardson *et al.* 1995). There is no empirical evidence that exposure to pulses of airgun sound is likely to cause serious injury or death in any marine mammal, even with large arrays of airguns (Southall *et al.* 2007). But high-level noise exposure has been implicated in mass stranding events among whales (*e.g.*, see Cox *et al.* 2006), and with source levels of up to 260 dB, the potential of seismic airgun arrays to acoustically injure marine mammals at close proximity must be considered.

In addition to seismic surveys for hydrocarbon-bearing formations,

geophysical surveys are conducted to produce imagery of sea-floor surfaces and substrates on a finer spatial scale. Sounds produced by the instruments used for these surveys vary in terms of frequency bands, source levels, repetition rates, and beam widths. Operating frequencies range from roughly 300 Hz to several hundred kHz with peak-to-peak source levels ranging from 170 to 240 dB (Crocker and Fratantonio 2016).

Pipe/Pile Driving—During the course of pile driving, a portion of the kinetic energy from the hammer is lost to the water column in the form of sound. Levels of underwater sounds produced during pile driving are dependent upon the size and composition of the pile, the substrate into which the pile is driven, bathymetry, physical and chemical characteristics of the surrounding waters, and pile installation method (impact versus vibratory hammer) (Illingworth and Rodkin 2007, 2014; Denes *et al.* 2016).

Both impact and vibratory pile installation produce underwater sounds of frequencies predominantly lower than 2.5 kHz, with the highest intensity of pressure spectral density at or below 1 kHz (Denes *et al.* 2016; Dahl *et al.* 2015; Illingworth and Rodkin 2007). Source levels of underwater sounds

produced by impact pile driving tend to be higher than for vibratory pile driving; however, both methods of installation can generate underwater sound levels capable of causing behavioral disturbance or hearing threshold shift in marine mammals, and both methods will be used in Cook Inlet.

Drilling Operations—For drilling operations, two project components have the potential to disturb sea otters: Installing the drive pipe at each well prior to drilling; and VSP operations that may occur at the completion of each well drilling. The types of underwater sounds generated by these activities are discussed in “Pile Driving” and “Geophysical Surveys,” respectively. Drilling and the associated noise from pumps and generators on the drill rig is not expected to produce underwater noise levels that will affect sea otters (*e.g.*, see Richardson *et al.* 1995; Spence *et al.* 2007; Marine Acoustics, Inc. 2011; Illingworth and Rodkin 2014).

Aircraft Overflights—Richardson *et al.* (1995) presented analyses of recordings of sounds produced by a Bell 212 helicopter. The estimated source levels for two of the flights were 149 and 151 dB re 1 μPa-m, and underwater received levels were 109 dB when the aircraft flew at an altitude of 152 m (500 ft) and

107 dB at a flight altitude of 305 m (1,000 ft). Received sound levels in air at the water surface would be 81 and 75 dB re 20 μ Pa for flights at 152 and 305 m (500 and 1,000 ft), respectively.

Anchor Handling—The characteristics of sounds produced by vessels are a product of several variables pertaining to the specifications of the vessel, including the number and type of engines, propeller shape and size, and the mechanical condition of these components. Operational status of the vessel, such as towing heavy loads or using bow thrusters, can significantly affect the levels of sounds emitted by the same vessel at different times (Richardson *et al.* 1995). Manipulation of anchors for the laying of the AGDC pipeline will involve vessel operations that are likely to be substantially louder than normal transit. Data from recent exploratory drilling activities in the Chukchi and Beaufort Seas indicate that anchor handling can intermittently produce sounds likely greater than 190 dB; the source level of the anchor-handling vessel was estimated to be 188 dB (LGL/JASCO/Greeneridge 2014). It is not known whether anchor handling will produce similar noise levels in Cook Inlet, but it will occur in areas where sea otters are uncommon and unlikely to be affected.

Airborne Sounds

The NMFS (2018a) guidance neither addresses thresholds for preventing injury or disturbance from airborne noise, nor provides thresholds for avoidance of Level B take. However, a review of literature by Southall *et al.* (2007) suggested thresholds for PTS and TTS for sea lions exposed to non-pulsed airborne noise of 172.5 and 159 dB re (20 μ Pa)²-s SEL. Behavioral responses to overflights are addressed in *Responses to Activities*.

Conveyance of underwater noise into the air is of little concern since the effects of pressure release and interference at the water's surface, which scatter and reflect sound, reduce underwater noise transmission into the air. For activities that create both in-air and underwater sounds, such as pile driving, we will estimate take based on parameters for underwater noise transmission. Because sound energy travels more efficiently through water than through air, this estimation will also account for exposures to animals at the surface.

Aircraft are the most significant source of airborne sounds. Proposed flights are to be conducted at an altitude of 305 m (1,000 ft) except during takeoff and landing. At the surface of the water, the received sound level from a

helicopter flown at this altitude is roughly 75 dB re 20 μ Pa (see "Noise-Generating Activities"), and so threshold shift is extremely unlikely.

Loud screams are used to communicate between pups and mothers at the surface (McShane *et al.* 1995), but sea otters do not appear to communicate vocally under water, and they do not use sound to detect prey. Although masking of these crucial airborne calls is possible, the duration of sound from aircraft will be brief and therefore unlikely to result in separation of females from pups.

Effects on Habitat and Prey

Habitat areas of significance for sea otters exist in the project area. Sea otter critical habitat was designated under the ESA (74 FR 51988, October 8, 2009). In Cook Inlet, critical habitat occurs along the western shoreline south of approximately Redoubt Point. It extends from mean high-tide line out to 100 m (328.1 ft) from shore or to the 20-m (65.6-ft) depth contour. Physical and biological features of critical habitat essential to the conservation of sea otters include the benthic invertebrates (*e.g.*, red sea urchins (*Mesocentrotus franciscanus*), blue mussels (*Mytilus spp.*), butter clams (*Saxidomus giganteus*), etc.) eaten by otters and the shallow rocky areas and kelp (*e.g.*, bull kelp (*Nereocystis luetkeana*) and dragon kelp (*Eularia fistulosa*) beds that provide cover from predators. Other important habitat in the applicant's project area includes outer Kamishak Bay between Augustine Island and Iniskin Bay within the 40-m (131-ft) depth contour where high densities of otters have been detected.

The applicant's planned activities include drilling, dredging, trenching, pile driving, and dock construction. These activities would change the physical characteristics of localized areas of habitat. Construction would result in seafloor disturbance. Docks can increase seafloor shading, which affects the amount of light penetration on the seafloor. Water quality may be affected by drilling-related discharges within limits permitted by the State of Alaska.

Sampling efforts at borrow and disposal areas before and after dredging activity have produced mixed results in terms of whether dredging causes significant changes to the productivity and diversity of infaunal benthic and epibenthic invertebrate communities (Fraser *et al.* 2017; Angonesi *et al.* 2006). The areas where dredging activities are proposed include a materials loading facility at Nikiski and along the planned AGDC pipeline route between Nikiski and Beluga; the

proposed disposal area is just west of Nikiski. This is beyond the northern limit of sea otter distribution in Cook Inlet, so effects of dredging upon invertebrate communities would not affect availability of prey to sea otters.

In addition to the disturbances outlined above to sea otters or their designated critical habitat, survey and construction activities could affect sea otter habitat in the form of impacts to prey species. The primary prey species for sea otters are sea urchins, abalone, clams, mussels, crabs, and squid (Tinker and Estes 1999). When preferential prey are scarce, otters will also eat kelp, turban snails (*Tegula spp.*), octopuses (*e.g.*, *Octopus spp.*), barnacles (*Balanus spp.*), sea stars (*e.g.*, *Pycnopodia helianthoides*), scallops (*e.g.*, *Patinopecten caurinus*), rock oysters (*Saccostrea spp.*), worms (*e.g.*, *Eudistylia spp.*), and chitons (*e.g.*, *Mopalia spp.*) (Riedman and Estes 1990).

Limited research has been conducted on the effects of noise on invertebrates (Normandeau Associates, Inc. 2012). Christian *et al.* (2003) concluded that there were no obvious effects from seismic signals on crab behavior and no significant effects on the health of adult crabs. Pearson *et al.* (1994) had previously found no effects of seismic signals upon crab larvae for exposures as close as 1 m (3.3 ft) from the array, or for mean sound pressure as high as 231 dB. Pearson *et al.* (1994) did not observe any statistically significant effects on Dungeness crab (*Cancer magister*) larvae shot as close as 1 m from a 231-dB source. Further, Christian *et al.* (2004) did not find any behavioral or significant health impacts to snow crabs (*Chionoecetes opilio*) exposed to seismic noise. The only effect noted was a reduction in the speed of egg development after exposure to noise levels (221 dB at 2 m), far higher than what bottom-dwelling crabs could be exposed to by seismic guns. Invertebrates such as mussels, clams, and crabs do not have auditory systems or swim bladders that could be affected by sound pressure. Squid and other cephalopod species have complex statocysts (Nixon and Young 2003) that resemble the otolith organs of fish that may allow them to detect sounds (Budelmann 1992).

Some species of invertebrates have shown temporary behavioral changes in the presence of increased sound levels. Fewtrell and McCauley (2012) reported increases in alarm behaviors in wild-caught captive reef squid (*Sepioteuthis australis*) exposed to seismic airguns at noise levels between 156–161 dB. Additionally, captive crustaceans have

changed behaviors when exposed to simulated sounds consistent with those emitted during seismic exploration and pile-driving activities (Tidau and Briffa 2016).

In general, there is little knowledge regarding effects of sound in marine invertebrates or how invertebrates are affected by high noise levels (Hawkins and Popper 2012). A review of literature pertaining to effects of seismic surveys on fish and invertebrates (Carroll *et al.* 2016) noted that there is a wide disparity between results obtained in field and laboratory settings. Some of the reviewed studies indicate the potential for noise-induced physiological and behavioral changes in a number of invertebrates. However, changes were observed only when animals were housed in enclosed tanks and many were exposed to prolonged bouts of continuous, pure tones. We would not expect similar results in open marine conditions. Given the short-term duration of sounds produced by each component of the proposed work, it is unlikely that noises generated by survey and construction activities will have any lasting effect on sea otter prey.

Potential Impacts From an Oil Spill or Unpermitted Discharge

We provided discussion of relevant impacts to sea otters from oil spills and unpermitted discharges in our **Federal Register** notice of proposed rulemaking (84 FR 10224, March 19, 2019) and do not repeat that information here. Adverse impacts of exposure to oil is well documented for sea otters (*e.g.*, Kooyman *et al.* 1976; Baker *et al.* 1981; Costa and Kooyman 1982, 1984; Engelhardt 1983; Lipscomb 1996; Bickham 1998; Monson 2000; Albers 2003; Peterson 2003). An oil spill or unpermitted discharge is an illegal act, and ITRs do not authorize take of sea otters caused by illegal or unpermitted activities. Typical spills that may result from the proposed activities are relatively small in scale and are not likely to affect otters. A large spill could affect large numbers of otters, but these events are rare. We do not anticipate effects to sea otters as a result of oil spills from this activity.

Collisions

Vessel collisions with marine mammals can result in death or serious injury. Wounds resulting from ship strike may include massive trauma, hemorrhaging, broken bones, or propeller lacerations (Knowlton and Kraus 2001). An animal at the surface may be struck directly by a vessel, a surfacing animal may hit the bottom of a vessel, or an animal just below the

surface may be cut by a vessel's propeller. Mortality associated with boat strike has been identified from recovery of carcasses with lacerations indicative of propeller injuries (*e.g.*, Wild and Ames 1974; Morejohn *et al.* 1975). From 1998 to 2001, boat strike was identified as the cause of death for 5 of 105 southern sea otter mortalities (Kreuder *et al.* 2003). From 2006 through 2010, evidence indicates that 11 southern sea otters were likely struck by boats (USGS and California Department of Fish and Game, unpublished data cited in 77 FR 59211–59220, September 26, 2012). From January 2003 to May 2013, researchers recovered 35 southern sea otters with trauma consistent with impact from a boat hull or propeller. These data suggest a rate of boat-strike mortality in California of 2.6 otters per year, or about 0.1 percent of the population size.

Boat strike has been documented as a cause of death across all three stocks of northern sea otters in Alaska. Since 2002, the Service has undertaken a health and disease study of sea otters in Alaska in which the Service conducts necropsies on sea otter carcasses to determine cause of death, disease incidence, and status of general health parameters. Of 1,433 necropsies conducted during 24 years, boat strike or blunt trauma was identified as a definitive or presumptive cause of death in 64 cases (4 percent) (USFWS unpublished data). It has been determined in most of these cases that, while trauma was the ultimate cause of death, there was a contributing factor, such as disease or biotoxin exposure, which incapacitated the animal and made it more vulnerable to boat strike (USFWS 2014).

In Alaska, the annual rate of documented mortality from boat strike was similar to that reported for California: 2.7 otters per year (USFWS unpublished data). However, compared to otters in California, Alaska otters belong to much larger and more dispersed populations where carcass recovery is lower. Instances of vessel collision are likely to be underreported, and the probability of collision is unknown.

Likelihood of vessel strikes involving sea otters appears to be primarily related to vessel speed. Most collision reports have come from small, fast-moving vessels (NMFS 2003). The severity of injuries to marine mammals during a boat strike also depends on vessel speed, with the probability of death or serious injury increasing as vessel speed increases (Laist *et al.* 2001; Vanderlaan and Taggart 2007). Because sea otters spend a considerable portion of their

time at the surface of the water, they are typically visually aware of approaching boats and are able to move away if a vessel is not traveling too quickly.

The probability of the specified activities in Cook Inlet causing a sea otter/vessel collision is very low for three reasons: First, most of the work will occur in lower-density regions of Cook Inlet; second, the project work will involve slow-moving, noisy vessels that sea otters can more easily avoid; and third, the specified activities will constitute only a small fraction of the total level of vessel traffic in the region, which increases the likelihood that otters in the project area are accustomed to avoiding vessels and will successfully avoid collisions with project vessels.

The AGDC pipeline work and work by Hilcorp and Harvest on maintenance of existing facilities will be conducted in MCI, in areas that are outside of the normal range of sea otters. The unusual occurrence of otters in MCI makes vessel collisions extremely unlikely. Hilcorp and Harvest will conduct their 3D seismic work in offshore areas of LCI where otter densities are also low. They will conduct 2D seismic work along the eastern shoreline of LCI where densities are higher, but vessel speeds during the specified activities will be slow. Hilcorp/Harvest's seismic vessels would travel at approximately 4 knots (kn) or 7.4 km per hour (km/hr) while towing seismic survey gear and a maximum of 4.5 kn (8.3 km/hr) while conducting geophysical surveys. Vessel speed during rig towing will generally be less than 5 kn. AGDC's pipeline construction operations will proceed at similar slow speeds. Anchor handling will occur at about 3 kn. For comparison, freighters in Cook Inlet travel at 20 to 24 kn (Eley 2006), and small recreational vessels may travel at 40 kn.

The applicant's support vessels and vessels in transit will travel at faster speeds; for example, Hilcorp/Harvest's maintenance activities will require the use of dive vessels, typically ranging up to 21 m (70 ft) in length and capable of approximately 7 kn (13 km/hr). The risk of collision is thus reduced, but not eliminated, by the predominance of slow-moving vessel work in areas of low density.

Commercial and recreational vessels are much more common in both space and time than are geophysical survey activities, drilling support operations, and pipeline work. Based on U.S. Coast Guard records and other local sources of information compiled by Eley (2006), 704 large vessels, other than fuel barges in domestic trade, called at Cook Inlet ports from January 1, 2005, through July 15, 2006. Almost two-thirds (65 percent)

of the calls were made by container vessels, cargo, or ferries. Twenty-nine percent (29 percent) of the vessel traffic was gas or liquid tankships calling primarily at Nikiski. Bulk carriers and general cargo ships represented 6 percent. Tugs and fishing and passenger vessels combined represented 2 percent of the Cook Inlet vessel traffic. Tugs made approximately 150 fuel barge transits a year, assisted in docking and undocking ships in Nikiski and Anchorage, and moved miscellaneous deck and gravel barges in and out of the Port of Anchorage. Although small vessels are less common than larger ships, they are the most likely source of collision due to faster speeds and their presence in shallow water where sea otters are common. In 2005, there were 570 commercial fishing vessels registered in the Cook Inlet salmon/groundfish fleet. Of these, 86 percent were 31–40 ft in length. Vessels in this size class typically travel at up to 30 kn while in transit. The high level of ship traffic in Cook Inlet allows many sea otters in Cook Inlet to habituate to vessels. This will reduce risk of collision for the project activities when vessels are in transit.

Although the likelihood of a project vessel striking a sea otter is low, we intend to require mitigation measures to reduce the risk of ship strike in all LOAs. We anticipate that vessel collisions involving a seismic-data-acquisition vessel towing gear or vessels conducting geophysical operations are unlikely given the rarity of documented collisions, the low densities of otters in most of the project areas, the frequent vessel traffic to which otters have become accustomed, and the slow vessel speeds. Vessels in transit and support vessels travelling at greater rates of speed are more likely to cause collisions.

Mitigation measures for reducing the probability of ship strike include speed reductions during periods of low visibility, required separation distances from observed otters, avoidance of nearshore travel, and use of navigation channels, when practicable. We believe these measures will further reduce the risk of collision. Given the required mitigation measures, the relatively slow speed of most of the project vessels, the presence of marine mammal observers, and the short duration of many of the activities, we believe that the possibility of ship strike is discountable. No incidental take resulting from ship strike is anticipated, and this potential effect of the specified activity will not be discussed further in the following analysis.

Characterizing Take

In the previous section, we discussed the components of the project activities that have the potential to affect sea otters. Here we describe and categorize the physiological and behavioral effects that can be expected based on documented responses to human activities observed during sea otter studies. We also discuss how these behaviors are characterized under the MMPA.

An individual sea otter's reaction to a human activity will depend on its prior exposure to the activity, its need to be in the particular area, its physiological status, or other intrinsic factors. The location, timing, frequency, intensity, and duration of the encounter are among the external factors that will also influence the animal's response.

Relatively minor reactions such as increased vigilance or a short-term change in direction of travel are not likely to disrupt biologically important behavioral patterns and are not considered take by harassment. These types of responses typify the most likely reactions of the majority of sea otters that will be exposed to the applicant's activities.

Reactions capable of causing injury are characterized as Level A harassment events. Examples include separation of mothers from young or repeatedly flushing sea otters from a haulout. Exposure to noise capable of causing PTS is also considered take by Level A harassment.

Intermediate reactions that disrupt biologically significant behaviors are considered Level B harassment under the MMPA. The Service has identified the following sea otter behaviors as indicating possible Level B take:

- Swimming away at a fast pace on belly (*i.e.*, porpoising);
- Repeatedly raising the head vertically above the water to get a better view (spyhopping) while apparently agitated or while swimming away;
- In the case of a pup, repeatedly spyhopping while hiding behind and holding onto its mother's head;
- Abandoning prey or feeding area;
- Ceasing to nurse and/or rest (applies to dependent pups);
- Ceasing to rest (applies to independent animals);
- Ceasing to use movement corridors along the shoreline;
- Ceasing mating behaviors;
- Shifting/jostling/agitation in a raft so that the raft disperses;
- Sudden diving of an entire raft;
- Flushing animals off a haulout.

This list is not meant to encompass all possible behaviors; other situations may

also indicate Level B take. It is also important to note that, depending on the duration and severity of the above-described behaviors, such responses could constitute take by Level A harassment, *e.g.*, repeatedly flushing sea otters from a haulout versus a single flushing event.

Direct and Indirect Effects

The reactions of wildlife to disturbance can range from short-term behavioral changes to long-term impacts that affect survival and reproduction. Most sea otters will respond to human disturbance with nonlethal reactions that are similar to antipredator responses (Frid and Dill 2002). Sea otters are susceptible to predation, particularly from killer whales and eagles, and have a well-developed antipredator response to perceived threats. Sea otters will swim away, dive, or hide among rocks or kelp, and will sometimes spyhop (vertically raise its head out of the water, presumably to look around) or splash when threatened. Limbaugh (1961) reported that sea otters were apparently undisturbed by the presence of a harbor seal (*Phoca vitulina*), but they were quite concerned with the appearance of a California sea lion. They demonstrated their fear by actively looking above and beneath the water when a sea lion was swimming nearby.

Although an increase in vigilance or a flight response is nonlethal, a tradeoff occurs between risk avoidance and energy conservation (Frid and Dill 2002). For example, southern sea otters in areas with heavy recreational boat traffic demonstrated changes in behavioral time budgeting showing decreased time resting and changes in haulout patterns and distribution (Benham 2006; Maldini *et al.* 2012). In an example described by Pavez *et al.* (2015), South American sea lions (*Otaria byronia*) visited by tourists exhibited an increase in the state of alertness and a decrease in maternal attendance and resting time on land, thereby potentially reducing population size. In another example, killer whales (*Orcinus orca*) that lost feeding opportunities due to boat traffic faced a substantial (18 percent) estimated decrease in energy intake (Williams *et al.* 2006). Such disturbance effects can have population-level consequences. Increased disturbance rates have been associated with a decline in abundance of bottlenose dolphins (*Tursiops sp.*) (Bejder *et al.* 2006; Lusseau *et al.* 2006).

These examples illustrate direct effects on survival and reproductive success, but disturbances can also have indirect effects. When disturbed by

noise, animals may respond behaviorally (e.g., escape response), as well as physiologically (e.g., increased heart rate, hormonal response) (Harms *et al.* 1997; Tempel and Gutierrez 2003). In the absence of an apparent behavioral response, an animal exposed to noise disturbance may still experience stress and direct energy away from fitness-enhancing activities such as feeding and mating. The energy expense and physiological effects could ultimately lead to reduced survival and reproduction (Gill and Sutherland 2000; Frid and Dill 2002). Changes in behavior from anthropogenic disturbance can also include latent agonistic interactions between individuals (Barton *et al.* 1998). Chronic stress can lead to weakened reflexes, lowered learning responses (Welch and Welch 1970; van Polanen Petel *et al.* 2006), compromised immune function, decreased body weight, and abnormal thyroid function (Selye 1979).

The type and extent of response may be influenced by intensity of the disturbance (Cevasco *et al.* 2001), the extent of previous exposure to humans (Holcomb *et al.* 2009), the type of disturbance (Andersen *et al.* 2012), and the age and/or sex of the individuals (Shaughnessy *et al.* 2008; Holcomb *et al.* 2009). Despite the importance of understanding the effects of disturbance, few controlled experiments or field observations have been conducted on sea otters to address this topic.

Responses to Activities

The available studies of sea otter behavior suggest that sea otters may be more resistant to the effects of sound disturbance and other human activities than some other marine mammals. For example, at Soberanes Point, California, Riedman (1983) examined changes in the behavior, density, and distribution of southern sea otters that were exposed to recorded noises associated with oil and gas activity. The underwater sound sources were played at a level of 110 dB and a frequency range of 50 to 20,000 Hz and included production platform activity, drillship, helicopter, and semi-submersible sounds. Riedman (1983) also observed the sea otters during seismic airgun shots fired at decreasing distances from the nearshore environment (50, 20, 8, 3.8, 3, 1, and 0.5 nautical miles) at a firing rate of 4 shots per minute and a maximum air volume of 4,070 cubic inches (in³). Riedman (1983) observed no changes in the presence, density, or behavior of sea otters as a result of underwater sounds from recordings or airguns, even at the closest distance of 0.5 nautical miles (<1

km or 0.6 mi). However, otters did display slight reactions to airborne engine noise. Riedman (1983, 1984) also monitored the behavior of sea otters along the California coast while they were exposed to a single 100-in³ airgun and a 4,089-in³ airgun array. Sea otters did not respond noticeably to the single airgun, and no disturbance reactions were evident when the airgun array was as close as 0.9 km (0.6 mi).

Sea otters spend from 30 to 80 percent of their time each day at the surface of the water resting and grooming (Riedman 1983, 1984; Bodkin *et al.* 2004; Wolt *et al.* 2012). While at the surface, turbulence from wind and waves attenuate noise more quickly than in deeper water, reducing potential noise exposure (Greene and Richardson 1988; Richardson *et al.* 1995). Additionally, turbulence at the water's surface limits the transference of sound from water to air. A sea otter with its head above water will be exposed to only a small fraction of the sound energy travelling through the water beneath it. Thus, the amount of total time spent at the surface may help limit sea otters' exposure during noise-generating operations.

Sea otters do not rely on sound to orient themselves, locate prey, or communicate underwater. Sea otters use sound for communication in air (especially mothers and pups; McShane *et al.* 1995) and may avoid predators by monitoring underwater sound. Davis *et al.* (1987) documented sea otters retreating from simulated killer whale vocalizations. Otters are not known to vocalize underwater and do not echolocate; therefore, masking of communications by anthropogenic sound is less of a concern than for other marine mammals.

Sea otters generally show a high degree of tolerance to noise. In another study using prerecorded sounds, Davis *et al.* (1988) exposed both northern sea otters in Simpson Bay, Alaska, and southern sea otters in Morro Bay, California, to a variety of airborne and underwater sounds, including a warble tone, sea otter pup calls, killer whale calls, airhorns, and an underwater noise harassment system designed to drive marine mammals away from crude oil spills. The sounds were projected at a variety of frequencies, decibel levels, and intervals. The authors noted that certain noises could cause a startle response and result in dispersal. However, the disturbance effects were limited in range (no responses were observed for otters approximately 100–200 m (328–656 ft) from the source of the stimuli), and habituation to the

stimuli was generally very quick (within hours or, at most, 3 to 4 days).

Southern sea otters in an area with frequent railroad noise appeared to be relatively undisturbed by pile-driving activities, many showing no response and generally reacting more strongly to passing vessels than to the sounds of pile-driving equipment (ESNERR 2011; ESA 2016). Additionally, many of the otters who displayed a reaction behavior during pile driving did so while their heads were above the surface of the water, suggesting that airborne noise was as important as, and possibly more important than underwater noise in prompting the animals' reactions. When sea otters have displayed behavioral reactions in response to noise, these responses were often short-lived; the otters resumed normal activities soon after a new sound was introduced (Davis *et al.* 1987, 1988).

Stimuli from shoreline construction activities, aircraft, and vessel traffic, including noise, are likely to cause some level of disturbance. Populations of sea otters in Alaska have been known to avoid areas with heavy boat traffic but return to those same areas during seasons with less traffic (Garshelis and Garshelis 1984). Sea otters in Alaska have shown signs of disturbance (escape behaviors) in response to the presence and approach of survey vessels, including: otters diving and/or actively swimming away from a boat; hauled-out otters entering the water; and groups of otters disbanding and swimming in multiple different directions (Udevitz *et al.* 1995).

In Cook Inlet, otters were observed riding the tides past a new offshore drilling platform while drilling was being conducted. Otters drifting on a trajectory that would have taken them within 500 m (0.3 mi) of the rig tended to swim to change their angle of drift to avoid a close approach, although noise levels from the work were near the ambient level of underwater noise (BlueCrest 2013).

Sea otter behavior is suggestive of a dynamic response to disturbance, influenced by the intensity and duration of the source. Otters initially abandon areas when disturbed and return when the disturbance ceases. Groups of sea otters in two locations in California showed markedly different responses to kayakers approaching to within specific distances, suggesting a different level of tolerance between the groups (Gunvalson 2011). Benham (2006) found evidence that the otters exposed to high levels of recreational activity may have become more tolerant than individuals in less-disturbed areas.

Some individual otters will habituate to the presence of project vessels, noise, and activity. Sea otters often seem quite tolerant of boats or humans nearby (e.g., Calkins 1979). Sea otters off the California coast showed only mild interest in boats passing within hundreds of meters and appeared to have habituated to boat traffic (Riedman 1983; Curland 1997). Boat traffic, commercial and recreational, is common in Cook Inlet. However, there are seasonal (*i.e.*, temporal) and spatial components to vessel traffic. Both recreational and commercial vessel traffic in Kachemak Bay is much higher than in western Cook Inlet, and all traffic is much higher in summer than in other months. Some sea otters in the area of activity are likely to have already become habituated to vessel traffic and noise caused by vessels, whereas for others, the specified activities will be a novel experience and will elicit a more intense response.

Some degree of disturbance is also possible from unmitigated aircraft activities. Individual sea otters in Cook Inlet will show a range of responses to noise from low-flying aircraft. Some may abandon the flightpath area and return when the disturbance has ceased. Based on the observed movement patterns of wild sea otters (*i.e.*, Lensink 1962; Kenyon 1969, 1981; Garshelis and Garshelis 1984; Riedman and Estes 1990; Tinker and Estes 1996; and others), we expect that some individuals, independent juveniles, for example, will respond to the project activities by dispersing to areas of suitable habitat nearby, while others, especially breeding-age adult males, will not be displaced by overflights. Mitigation measures will stipulate a minimum of 305 m (1,000 ft) flight altitude to minimize harassment of otters.

Given the observed responses of sea otters to sources of disturbance, it is likely that some degree of take by harassment will occur due to underwater noise stimuli associated with the specified activities. Some otters will likely show startle responses, change direction of travel, disperse from the area, or dive. Sea otters reacting to project activities may expend energy and divert time and attention from biologically important behaviors, such as feeding. Some effects may be undetectable in observations of behavior, especially the physiological effects of chronic and cumulative noise exposure. Air and vessel traffic, commercial and recreational, is routine in Cook Inlet. Construction activities are common. Some sea otters in the area of activity may become habituated to the

project noise or may already be habituated to noise due to previous and ongoing exposure to frequent air traffic and other activities in the area and will have little, if any, reaction to project activities.

Mitigation and Monitoring

When the Service issues an ITR, we specify means for effecting the least practicable adverse impact on sea otters and their habitat, paying particular attention to habitat areas of significance, and on the availability of sea otters for taking for subsistence uses by coastal-dwelling Alaska Natives. These measures are stipulated in § 18.137 Mitigation.

In evaluating what mitigation measures are appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses, we considered the manner in which, and the degree to which, the successful implementation of the measures are expected to reduce impacts to sea otters, stocks, and their habitat, as well as subsistence uses. We considered the nature of the potential adverse impact being mitigated (likelihood, scope, range), the likelihood the measures will be effective, and the likelihood the measures will be implemented. We also considered the practicability of the measures for applicant implementation (*e.g.*, cost, impact on operations).

To reduce the potential for disturbance from noise associated with the activities, the following mitigation measures are required:

- Development of marine mammal monitoring and mitigation plans;
- Establishment of an exclusion zone (EZ) and safety zone (SZ) during noise-generating work;
- Visual mitigation monitoring by designated protected species observers (PSOs);
- Site clearance before startup;
- Shutdown procedures;
- Ramp-up procedures; and
- Vessel strike avoidance measures.

This ITR establishes the process for evaluating specific activities in specific project areas and determining the appropriate mitigation measures to be included in an LOA. A marine mammal mitigation and monitoring plan (4MP) is required for all LOAs. The 4MP identifies the specific avoidance and minimization measures an applicant will take to reduce effects to otters. It describes the project in detail, assesses the effects, identifies effective means to avoid effects, and describes specific methods for limiting effects when they cannot be avoided.

During “noise-generating work” (work that creates underwater sound louder than 160 dB and within the frequency hearing range of sea otters), an applicant will establish and monitor an EZ. The EZ is defined as the area surrounding a sound source in which all operations must be shut down in the event a sea otter enters or is about to enter this zone based on distances to Level A thresholds. Any otter detected within this zone will be exposed to sound levels likely to cause take by Level A harassment. The SZ is an area larger than the EZ and is defined as the area in which otters may experience noise above the Level B exposure threshold. Sea otters observed inside the SZ are likely to be disturbed by underwater noise, and each otter within the SZ will be counted as one Level B take. In the event a sea otter is in or about to enter the zone, operations will be powered down, when practicable, to minimize take. Radii of each SZ and EZ will be specified in each LOA issued under this ITR. The methodology for calculation of the radii will be described in each LOA and is identified in § 18.137 Mitigation. Sound source levels will be monitored and evaluated in the field prior to conducting 2D and 3D seismic surveys. This on-site sound source verification (SSV) testing will be used to determine the size of the SZ and EZ for these activities. A minimum 10-m (33-ft) shutdown zone will be observed for all in-water construction and heavy machinery.

PSOs will be stationed on the source vessel or at a suitable vantage point with maximum view of the SZ and EZ. The PSOs will determine that the EZ is clear of sea otters prior to the start of daily activities or if activities have been stopped for longer than a 30-minute period. The PSOs will ensure that no sea otters are observed in the EZ for a period of 30 minutes prior to work commencing.

For the 2D survey, PSOs will be stationed on the source vessel during all seismic operations and geohazard surveys when the sub-bottom profilers are used. Because of the proximity to land, PSOs may also be stationed on land to augment the viewing area. For the 3D survey, PSOs will be stationed on at least two of the project vessels: The source vessel and the chase vessel. For the vertical seismic profiling, PSOs will be stationed on the drilling rig. For geohazard surveys, PSOs will be stationed on the survey vessel. The viewing area may be augmented by placing PSOs on a vessel specifically for mitigation purposes or using an unmanned aircraft system (drone). If drones will be used in areas with sea

otters, mitigation measures will be required to ensure drone use does not disturb otters. These measures may include maintaining a minimum altitude and horizontal distance no less than 100 m away from otters, conducting continuous visual monitoring by PSOs, and ceasing activities in response to sea otter behaviors indicating any reaction to drones.

A power-down procedure will be in place during seismic work. It will provide the option of reducing the number of airguns in use, which reduces the EZ or SZ radius. Alternatively, a shutdown procedure may be necessary, during which all airgun activity is suspended immediately. During a power-down, a single airgun (“mitigation gun”) may be operated, maintaining a sound source with a much-reduced EZ. If a sea otter is detected outside of either the SZ or EZ but is likely to enter that zone, the airguns may be powered down before the animal is within the radius, as an alternative to a complete shutdown. Likewise, if a sea otter is already within the SZ when first detected, the airguns may be powered down if this is a reasonable alternative to an immediate shutdown. If a sea otter is already within the EZ when first detected, the airguns will be shut down immediately. All power-down events will be at the discretion of the operator in cooperation with the PSOs. The applicant has determined that it is not practicable to power down in response to all sea otters within the SZ, and that to do so would incapacitate the 2D and 3D seismic operations. Because power-down events will be discretionary, all otters within the SZ will be assumed to experience Level B take regardless of whether a power-down is conducted. Although there is no calculated reduction of take estimated for this mitigation measure due to uncertainty in its application, it is expected that some unquantified benefits to sea otters will be realized whenever the operator powers down to reduce or avoid sea otter noise exposures.

A shutdown will occur when all underwater sound generation that is louder than 160 dB and within the frequency hearing range of sea otters is suspended. The sound source will be shut down completely if a sea otter approaches the EZ or appears to be in distress due to the noise-generating work. The shutdown procedure will be accomplished as soon as practicable upon the determination that a sea otter is either in or about to enter the EZ, and generally within several seconds. Following a shutdown, noise-generating

work will not resume until the sea otter has cleared the EZ. Any shutdown due to a sea otter sighting within the EZ must be followed by a 30-minute all-clear period and then a standard, full ramp-up. Any shutdown for other reasons resulting in the cessation of the sound source for a period greater than 30 minutes must also be followed by full ramp-up procedures.

A “ramp-up” procedure will be in place to gradually increase sound volume at a specified rate. Ramp-up is used at the start of airgun operations, including after a power-down, shutdown, or any period greater than 10 minutes in duration without airgun operations. The rate of ramp-up will be no more than 6 dB per 5-minute period. Ramp-up will begin with the smallest gun in the array that is being used for all airgun array configurations. The ramp-up procedure for pipe/pile driving involves initially starting with soft strikes or a reduced level of energy. If the complete EZ has not been visible for at least 30 minutes prior to the start of operations, operation of a mitigation gun may be required during the interruption of seismic survey operations prior to commencing ramp-up procedures. It will not be permissible to ramp up the full array from a complete shutdown in thick fog or at other times when the outer part of the Level A EZ is not visible. Ramp-up of the airguns will not be initiated if a sea otter is sighted within the EZ at any time.

A speed or course alteration is appropriate if a sea otter is detected outside the EZ and, based on its position and relative motion, is likely to enter the EZ, and a vessel’s speed and/or direct course may, when practical and safe, be changed. This technique can be used in coordination with a power-down procedure. The sea otter activities and movements relative to the seismic and support vessels will be closely monitored to ensure that the sea otter does not approach within the EZ. If the sea otter appears likely to enter the EZ, further mitigative actions will be taken, *i.e.*, further course alterations, power-down, or shutdown of the airguns.

This ITR establishes the stakeholder engagement process that the applicant is required to undertake in order to obtain an LOA for incidental take of sea otters. This process is an ongoing collaborative process between the applicant, the Service, and subsistence users of sea otters. Stakeholder engagement efforts for the specified activities have been ongoing since mid-2018 and have indicated that a plan of cooperation (POC) is necessary for the Hilcorp and

Harvest 3D seismic work. The POC must include a schedule for meeting with the affected communities, both prior to and while conducting the activities, a plan for resolving any conflicts, suggested means for resolving conflict, and process for notifying the communities of any changes in the operations.

The measures described here and required in § 18.137 through § 18.140, Mitigation, Monitoring, Reporting Requirements, and Measures to Reduce Impacts to Subsistence Users, are those determined to achieve the least practicable adverse impact to northern sea otters and their availability for subsistence use. These mitigation measures were evaluated against a suite of possible alternatives to determine whether they would effect the least practicable adverse impact on the species, their habitat, and the availability of the species for subsistence uses.

Alternative mitigation measures were evaluated but ultimately rejected as either not feasible, not practicable, not likely to be implemented effectively, or no more likely to be successful in reducing the impacts of the applicant’s project. We considered requiring work to be paused or stopped to prevent exposure of northern sea otters to levels of noise exceeding a 160-dB Level B take threshold. The distances to the 160-dB sound isopleths for several of the specified activities are greater than 1 km (0.6 mi). Avoiding all northern sea otters within these distances would require work to shut down or power down for prolonged and repeated periods, which the applicant has determined would incapacitate the project. Therefore, this is not a practicable mitigation measure.

The Service considered alternative mitigation measures based on observing and interpreting northern sea otter behaviors for preventing Level B harassment. Presently, mitigation protocols use sound exposure to predict behavioral responses rather than observing behavior directly. While direct observation of injury or the disruption of a behavioral pattern is the definitive criteria for identifying take once it has occurred, at present there is insufficient data to develop observation-based criteria for preventing harassment. Thus, monitoring of behavioral responses is useful for identifying take after it occurs, but not for preventing or mitigating it. As such, effectiveness of monitoring protocols based on behavior cannot be ascertained. Therefore, behavior-based mitigation was not a feasible alternative.

We considered requiring the use of alternative technologies such as marine vibroseis to reduce or eliminate the

need for seismic airguns. Hilcorp and Harvest have requested takes of marine mammals incidental to the seismic survey operations described in the petition, which identified airgun arrays as the preferred data acquisition tool. It would be inappropriate for the Service to require the applicant to change the specified activity unless it was necessary to make the findings established for issuance of incidental take under the MMPA or necessary for achieving the least practicable adverse impact to the marine mammal stock. Currently, no alternative technology scaled for industrial use is reliable enough to meet the environmental challenges of operating in Cook Inlet. Many prototypes are currently in development and may ultimately become important for achieving the least practicable level of effect on marine mammals, but none of these technologies are currently practicable for use on a large scale in Cook Inlet.

The option of designating seasonal exclusion areas within the specified geographic area was considered. However, no activities are planned in areas of Cook Inlet known to provide important habitat. Kachemak Bay, Kamishak Bay, and the designated critical habitat along the western shoreline of LCI and MCI are known areas of important habitat, but have not been identified as the target location of any planned activity in this rule. There is some information that suggests that the east coast of Cook Inlet along the Kenai Peninsula may be used seasonally by sea otters in late summer (BlueCrest 2013). Restrictions on seismic survey operations in this area during this time period might reduce the probability of disturbance of sea otters. However, there is currently insufficient information to support a seasonal restriction in eastern Cook Inlet. Little is known about the extent or duration of the use of the area by sea otters or what life-history functions the area supports. The benefit such a designation might offer is entirely unknown and, until additional information is available, remains speculative.

Compensatory mitigation was considered. Some environmental laws allow compensatory mitigation, such as habitat restoration projects, to be used by the applicant to offset effects of the project activities that cannot otherwise be avoided. The Service is issuing an authorization for incidental take of sea otters under the MMPA. The MMPA requires that impacts be reduced to the least practicable level, but does not require offsets. The Service must consider the practicability of implementation of measures to reduce

impacts, as well as proven or likely effectiveness of those measures. The impacts to sea otters and their habitat in Cook Inlet will be primarily acoustic and temporary in nature. We are not currently aware of literature demonstrating the effectiveness of habitat restoration for mitigating the effects of underwater noise. Additionally, we are not aware of any practicable habitat improvement projects in Cook Inlet that would have demonstrable benefits for the affected stocks.

In order to issue an LOA for an activity, section 101(a)(5)(A) of the MMPA states that the Service must set forth "requirements pertaining to the monitoring and reporting of such taking." The Service's implementing regulations at § 18.27(d)(vii) stipulate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting. Effective reporting is critical to compliance as well as ensuring that the most value is obtained from the required monitoring. The applicant will employ PSOs to conduct visual project monitoring. SSV monitoring will be conducted to document sound levels produced by the work. During 2D and 3D seismic surveys, Hilcorp and Harvest have agreed to conduct aerial overflights for avoidance of other marine mammal species, which will improve monitoring of sea otters. Additional monitoring and reporting requirements are at § 18.138 Monitoring and § 18.139 Reporting requirements.

Alternative monitoring measures were considered, but they were not incorporated in this rule. Passive acoustic monitoring is appropriate for some species of marine mammals but is not indicated for sea otters, which are not known to vocalize extensively underwater. Visual monitoring during all times of day and night was rejected because limited visibility during periods of darkness would prevent the detection of animals. Thermal monitoring or monitoring of sea otters with unmanned aircraft systems (drones) has not yet been fully tested and evaluated for use in Cook Inlet, but may prove useful in the future. Requiring visual observation and PSO monitoring of 100 percent of all spatial areas within the 160-dB ensonification area was also considered, but for 2D and 3D seismic surveys in particular, this was not expected to be achievable. We instead accounted for all sea otter exposures to 160 dB or greater in our estimation of take, and we did not reduce this number to attempt to account for some proportion of the total

that might be avoided when detected by PSO monitoring.

Estimated Incidental Take

This section provides the number of incidental takes estimated to occur because of the planned activities. The number of takes were analyzed to make the required small numbers and negligible impact determinations.

Estimating Exposure Rates

The Service anticipates that incidental take of sea otters may occur during the project activities in Cook Inlet. Noise, aircraft, vessels, and human activities could temporarily interrupt feeding, resting, and movement patterns. Elevated underwater noise levels from seismic surveys may cause short-term, nonlethal, but biologically significant changes in behavior that the Service considers harassment. Pile-driving and other construction activities along the shoreline may have similar effects and could cause behavioral disturbance leading to take. Harassment (Level A or B) is the only type of take expected to result from these activities; no lethal take is expected.

The number of animals affected will be determined by the distribution of animals and their location in proximity to the project work. Although we cannot predict the outcome of each encounter, it is possible to consider the most likely reactions, given observed responses of sea otters to various stimuli.

Sound exposure criteria provide the best available proxy for estimation of exposure to harassment. The behavioral response of sea otters to shoreline construction and vessel activities is related to the distance between the activity and the animals. Underwater sound is generated in tandem with other airborne visual, olfactory, or auditory signals from the specified activities, and travels much farther. Therefore, estimating exposure to underwater sound can be used to estimate the take from project activities.

No separate exposure evaluation was done for activities that do not generate underwater sound. Nearly all of the planned activities that may disturb sea otters will occur simultaneously with in-water activities that do generate sound. For example, operation of heavy equipment along the shoreline will facilitate underwater pile driving. The otters affected by the equipment operations are the same as those affected by the pile driving. Sound exposure and behavioral disturbances are accumulated over a 24-hour period, resulting in estimation of one exposure from all in-water sources rather than one each from equipment operations

and pile-driving noise. Aircraft support activities will be conducted without a corresponding underwater sound component, but no take is expected from this source of disturbance; see "Airborne Sounds."

To estimate the exposure of sea otters to take, we first calculated the number of otters in Cook Inlet that occur within the project area. The number of otters was calculated from density multiplied by project area. Density was estimated according to region in Cook Inlet.

Density data for Kamishak and the East side of Cook Inlet along the shore of the Kenai Peninsula was derived from aerial surveys conducted in May 2017 (Garlich-Miller *et al.* 2018). Surveys were not conducted for central Cook Inlet in 2017, and the 2017 surveys for western Cook Inlet north of Kamishak did not yield useful results. Therefore, the density for those regions was derived from the 2002 surveys conducted by Bodkin *et al.* (2003) and corrected for population growth proportional to the growth rate of Cook Inlet as a whole, as determined from comparison of the 2002 and 2017 surveys. Density values (in otters per km²) were 1.7 in East Cook Inlet (excluding Kachemak Bay and the outer Coast of Kenai Peninsula south and east of Seldovia), 3.53 in Kamishak Bay, and 0.026 in West and Central Cook Inlet. There are no density data for sea otters in the MCI region north of approximately 60°14' N (the latitude of Clam Gulch), and otters are uncommon north of about 60°24' N. Therefore, densities north of Clam Gulch were conservatively assumed to equal the 2002 mid-Cook Inlet survey region density of 0.01 per km² from Bodkin *et al.* (2003).

The geographic area of activity covers approximately 11,084 km² (4,280 mi²) in Cook Inlet. Of this area, 1,572 km² (607 mi²) is in East Cook Inlet, 725 km² (280 mi²) in Kamishak Bay, 4,341 km² (1,676 mi²) in West and Central Cook Inlet, and 4,445 km² (1,716 mi²) in Cook Inlet north of the normal range of sea otters. The total number of otters within the project area was calculated to be 5,389 otters ((1,572 × 1.7) + (725 × 3.53) + (4,341 × 0.026) + (4,445 × 0.01) = 5,389).

Not all otters in the project area will be exposed to noise levels capable of causing take from project activities. Many activities associated with oil and gas exploration, development, production, and transportation may result in underwater sounds that do not meet Levels A and B acoustic harassment criteria. The acoustic characteristics of the different project activities are described in table 3. Only

those specific activities with the likelihood of meeting the acoustic exposure criteria and occurring in the normal range of sea otters were evaluated for estimation of potential Levels A and B harassment.

Specifically, Hilcorp and Harvest's activities include 2D and 3D seismic surveys, vibratory driving of sheet piles at the Iniskin Peninsula causeway in Chinitna Bay, sub-bottom profilers used in high- and low-resolution geohazard surveys, drive-pipe installation, vertical seismic profiling, plug-and-abandon activities, and use of water jets during routine maintenance. AGDC's activities include pile driving and anchor handling.

The number of exposures to underwater sound levels capable of causing take by Level A harassment from specific project elements was estimated using the thresholds recommended by NMFS (2018a,b) for otariid pinnipeds (232 dB peak and 203 dB SEL_{cum}). For Level B harassment we used a 160-dB threshold. We multiplied the estimated area of ensonification (km²), by the density of sea otters in that area (number (#) of otters per km²) to estimate the number of otters in the ensonified area. This value was then multiplied by the maximum duration of the activity (# of days) over the course of the 5-year regulatory period to get the total number of exposures to sound above the thresholds for take.

Predicting Behavioral Response Rates

Although we cannot predict the outcome of each encounter between a sea otter and the equipment and vessels used for the planned activities, it is possible to consider the most likely reactions. Sea otters do not appear highly reactive to underwater sounds, but the presence of vessels may elicit stronger behavioral responses (see *Responses to Activities*). Whether an individual animal responds behaviorally to the presence of vessels and equipment is dependent upon several variables, including the activity of the animal prior to stimulus, whether the animal is habituated to similar disturbances, whether the animal is in a state of heightened awareness due to recent disturbances or the presence of predators, group size, the presence of pups, and the temperament of the individual animals. We assumed all animals exposed to underwater sound levels that meet the acoustic exposure criteria shown in table 5 would experience Level A or Level B take.

Calculating Take

The total take of sea otters from these oil and gas activities in Cook Inlet was

estimated by calculating the number of otters in the ensonified area during the full duration (the maximum number of days) of each project activity. After publication of the proposed ITR in the **Federal Register**, the applicant provided updates and minor modifications to their project plans. Changes included an increase in the 3D seismic survey line length from 74 km (46 mi) to 127 km (79 mi), an adjustment to account for the proportion of line length actively surveyed with the airgun array each day, use of a boomer rather than chirper sub-bottom profiler, and changes to the total duration (number of days) of pile driving and vertical seismic profiling in TB and LCI. The changes are reflected in the analysis presented here. Details of the project activities and calculations of take are included in the applicant's updated petition (June 2019) available at www.regulations.gov under docket number FWS-R7-ES-2019-0012. Methods used for calculating take did not change, but the resulting estimates have been updated. The total take increased from 1,666 to 1,687.

Distances to Thresholds

To calculate the ensonified area, we first estimated the distances that underwater sound will travel before attenuating to levels below thresholds for take by Level A and Level B harassment. The distances to the Level A thresholds were calculated using the NMFS Acoustical Guidance Spreadsheets (NMFS 2018b) using thresholds for otariid pinnipeds as a proxy for sea otters. Distances to the 160-dB Level B threshold were calculated using a practical spreading transmission loss model (15 LogR). The only exceptions to the use of the practical spreading model were made when data was available from a site-specific sound source verification of substantially similar equipment used and powered in a similar manner to that proposed by the applicant.

Model estimates incorporated operational and environmental parameters for each activity. For example, sound levels at the source are shown in table 3, and characteristics of the sound produced are shown in table 6. Weighting factor adjustments were used for SEL (sound exposure level) calculations based on NMFS Technical Guidance (2018b). Operational parameters were estimated from the updated description of activities.

The distances to the modelled Level A and Level B thresholds are shown in table 7. Each estimate represents the radial distance away from the sound source within which a sea otter exposed to the sound of the activity is expected

to experience take by Level A or Level B harassment.

TABLE 6—ASSUMPTIONS USED IN CALCULATING DISTANCES TO LEVEL A AND LEVEL B THRESHOLDS

Activity	Type of source	Source level ¹	WFA ²	Source velocity	Pulse duration	Repetition rate	Duration per day
2D/3D seismic	Mobile impulsive	217 @100 m (185 dB _{SEL} @100 m).	1 kHz	2.05 m/s	N/A	every 6 s	3D: 10 hrs/day. 2D: 2 hrs/day.
Sub bottom profiler	Mobile impulsive	212 @1 m	4 kHz	2.05 m/s	0.02 s	every 0.30 s	N/A.
Impact pile driving	Stationary impulsive	≤195 @10 m	2 kHz	N/A	N/A	1,560 strikes/hr	≤5.5 hrs/day.
Pipe driving	Stationary impulsive	≤195 @55 m	2 kHz	N/A	0.02 s	≤1,560 strikes/hr	≤4.8 hrs/day.
Vertical seismic profiling.	Stationary impulsive	227 @1 m	1 kHz	N/A	0.02 s	every 6 s	4 hrs/day.
Impact sheet piling	Stationary impulsive	190 @10 m	2 kHz	N/A	0.02 s	1,560 strikes/hr	3 hrs/day.
Vibratory sheet piling	Stationary non-impulsive.	160 @10 m	2.5 kHz	N/A	N/A	N/A	≤4.8.
Water jet	Stationary non-impulsive.	176 @1 m	2 kHz	N/A	N/A	N/A	0.5 hrs/day.
Anchor handling	Mobile non-impulsive	179 @1 m	1.5 kHz	1.54 m/s	N/A	N/A	3 hrs/day.

¹ Source level is given in dBrms, unless otherwise indicated, as measured at the given distance from the source in meters. WFA = Weighting Factor Adjustment, SEL = sound exposure level.

TABLE 7—CALCULATED DISTANCE IN METERS (m) TO LEVEL A AND LEVEL B THRESHOLDS

Activity	Level A—NMFS otariid			Level B
	Impulsive		Non-impulsive	Both
	232 dB peak	203 dB SEL	219 dB SEL	160 dB rms
2D/3D seismic	10	1.32	N/A	7,330
Sub-bottom profiler	0.05	1	N/A	2,929
Pipe driving, Chinitna Bay	0.19	39.48	N/A	1,630
VSP	0.46	284.84	N/A	2,470
Vibratory sheet pile driving	N/A	N/A	0.46	10
Water jet	N/A	N/A	0.54	11.66
18- and 24-inch pipe, impact	0.22	50.53	N/A	1,874.85
48- and 60-inch pipe, impact	0.34	147.99	N/A	2,154.43
all sizes pipe, vibratory	N/A	N/A	3.30	46.42
Sheet pile, impact	0.16	68.69	NA	1,000
Sheet pile, vibratory	N/A	N/A	0.71	10
Anchor handling	N/A	N/A	0.00	0.00

SEL = sound exposure level.

Area and Duration

The area of ensonification is the area in which an animal exposed to underwater sound is expected to experience take from Level A or Level B harassment based on the distance to the Level A and Level B thresholds. The area of a circle ($A = \pi r^2$) where r is the distance to the Level A or Level B threshold was used to calculate the area of ensonification for impulsive stationary sources (pipe driving, vertical seismic profiling), non-impulsive stationary sources (water jets, vibratory pile driving). For impulsive mobile sources (2D/3D seismic, sub-bottom profiler), the radial area was then multiplied by the distance of the line to be surveyed each day to get the total area of ensonification. Otters spend most of their time at the water's surface or below their last surface location, so a circle with the sound source at its center is a reasonable representation of the ensonified area. For shoreline

activities, the area of the circle is divided by two to remove the area that lies above the shoreline. The daily area of ensonification was then multiplied by the duration of the activity in number of days and the density of otters in the applicable region of Cook Inlet to estimate the number of otters that might be taken. In total, 1,687 instances of take are expected. The total Level A take of sea otters in Cook Inlet over the 5-year course of this ITR is anticipated to be 3. The total number of takes from each project activity is presented in table 8.

For some projects, like the 3D seismic survey, the design of the project is well developed; therefore, the duration is well defined. However, for other projects, the duration is not well developed, such as activities around the LCI well sites. In each case, the calculations are based on the applicant's best forecast of activities in the 5-year ITR period. The assumptions regarding duration of these activities are presented

in the applicant's updated petition (June 2019). The durations used for each activity are provided in table 8. For Level B take, we assumed one take per otter per day regardless of duration of work within a day. The resulting estimate of the total number of Level B takes expected from planned oil and gas activities in Cook Inlet from 2019 through the date 5 years from the effective date of the final rule is 1,684.

The proposed ITR included calculation of the numbers of individual otters taken. Those estimates have been removed from this ITR because the methodology used to calculate take of individuals led to substantial uncertainty in the accuracy of the estimates. We here rely instead on the number of takes to determine the likely effects to the stock. The total number of takes is expected to be higher than the number of otters taken because, for example, a resident otter may be taken on each day of noise-generating activity.

TABLE 8—ESTIMATE OF TOTAL TAKE FOR EACH ACTIVITY

Applicant	Activity	Density (#/km ²)	Duration (days)	Level A			Level B
				Impulsive		Non-impulsive	
				232 pk	203 SEL	219 SEL	160 rms
Hilcorp/Harvest Alaska	2D seismic	1.705	10.000	1.023	0.135		749.859
	3D seismic	0.026	60	1.155	0.152		846.896
	Vibratory sheet pile driving	0.026	20			0.000	0.000
	Sub-bottom profiler-LCI	0.026	28	0.001	0.014		46.291
	Sub-bottom profiler-NCI	0.010	7	0.000	0.001		4.740
	Sub-bottom profiler-TB	0.010	14	0.000	0.003		9.479
	Sub-bottom profiler-MCI	0.010	3	0.000	0.000		2.031
	Pipe driving-LCI	0.026	12	0.000	0.002		2.604
	Pipe driving-TB	0.010	6	0.000	0.000		0.501
	VSP-LCI	0.026	8	0.000	0.040		3.987
	VSP-TB	0.010	4	0.000	0.008		0.767
AGDC	Product Loading Facility	0.010					
	48-inch impact		56	0.000	0.019		4.083
	60-inch impact	0.010	106	0.000	0.036		7.728
	Temporary MOF	0.010					
	18- and 24-inch vibratory		301			0.000	0.010
	18- and 24-inch impact	0.010	7	0.000	0.000		0.510
	48-inch impact	0.010	7	0.000	0.002		0.510
	60-inch vibratory	0.010	11			0.000	0.000
	sheet vibratory	0.010	66			0.000	0.000
	Mainline MOF	0.010					
	sheet vibratory		7			0.000	0.000
	sheet impact	0.010	7	0.000	0.001		0.110
	Anchor handling	0.010	76			0.000	0.000
Total				2.18	0.42	0.00	1,683.108

SEL = sound exposure level, LCI = Lower Cook Inlet, MCI = Middle Cook Inlet, NCI = North Cook Inlet, TB = Trading Bay, MOF = material offloading facility, VSP = vertical seismic profiling.

The number of takes from each stock was estimated by categorizing each activity by its location relative to sea otter stock boundaries. Some activities will occur within both the southcentral Alaska and southwest Alaska stock boundaries. For these, take was assigned in proportion to the area of the activity within each stock region. Table 9 shows the activities in relation to the sea otter stock boundaries as they were assigned

for this analysis. The total number of takes of sea otters from the southwest Alaska stock is 418. The take number from the southcentral Alaska stock is 1,269.

The total number of takes by Level A harassment is estimated to be 2.6. When the total take from each activity (table 8) is multiplied by the proportion of that activity occurring within each stock boundary (table 9), the sum of take is 0.6

and 2 within the southwest Alaska and southcentral Alaska stocks, respectively. Because the number of takes from the southwest Alaska stock is 0.6, and take cannot occur unless it affects an animal, we rounded the number of takes from the southwest Alaska stock from 0.6 to 1. The total take is summarized in table 10.

TABLE 9—PERCENT OF EACH ACTIVITY OCCURRING WITHIN EACH STOCK BOUNDARY

Applicant	Activity	Southwest Alaska stock (%)	Southcentral Alaska stock (%)
Hilcorp & Harvest Alaska	2D seismic		100
	3D seismic	44	56
	Vibratory sheet pile driving	100	
	Sub-bottom profiler—LCI	44	56
	Sub-bottom profiler—NCI	100	
	Sub-bottom profiler—TB	100	
	Sub-bottom profiler—MCI	100	
	Pipe driving—LCI	50	50
	Pipe driving—TB	100	
	VSP—LCI	50	50
	VSP—TB	100	
	Hydraulic grinder	100	
	Water jet	100	
	AGDC	<i>Product Loading Facility</i>	
48-inch impact			100
60-inch impact			100
<i>Temporary MOF:</i>			
18-inch vibratory			100
24-inch impact			100
48-inch impact		100	
60-inch vibratory		100	

TABLE 9—PERCENT OF EACH ACTIVITY OCCURRING WITHIN EACH STOCK BOUNDARY—Continued

Applicant	Activity	Southwest Alaska stock (%)	Southcentral Alaska stock (%)
	sheet vibratory	100
	<i>Mainline MOF:</i>		
	sheet vibratory	100
	sheet impact	100
	Anchor handling	50	50

LCI = Lower Cook Inlet, MCI = Middle Cook Inlet, NCI = North Cook Inlet, TB = Trading Bay, MOF = material offloading facility.

TABLE 10—SUMMARY OF ESTIMATES OF SEA OTTER TAKE BY LEVEL A AND LEVEL B HARASSMENT AND STOCK

Type	Unit of take	Southwest Alaska stock	Southcentral Alaska stock	Sum
Level A	Number of takes	1	2	3
Level B	Number of takes	417	1,267	1,684
Total	Number of takes	418	1,269	1,687

Annual Estimates of Take

The estimates of exposures by activity and location discussed in the previous section are not representative of the estimated exposures per year (*i.e.*, annual takes). It is difficult to characterize each year accurately because many of the activities are progressive (*i.e.*, they depend on results and/or completion of the previous activity). This results in much uncertainty in the timing, duration, and complete scope of work. Each year, each applicant will submit an application for an LOA with the specific details of the planned work for that year and estimated take numbers. Table 11 summarizes the activities according to a scenario presented in the applicant's

updated petition (June 2019). This scenario combines the most realistic progression by Hilcorp and Harvest with an optimistic scenario for AGDC. In the first season, Hilcorp and Harvest plan to conduct 3D seismic surveys. In the second season, in LCI they plan to conduct activities for one well; in MCI, they plan to conduct plugging and abandonment activities in the NCI and two wells in the TB area. In the third season, activities include drilling two wells in LCI. The final well in LCI is planned for the fourth season.

The timing of AGDC's activities will depend on final authorizations and funding and may begin in 2020 rather than 2019. Season 1 will be the first year of project work regardless of year,

followed by season 2 during the second year, etc. Work will generally occur from April through October. Material offloading facilities will be constructed in the first and second season, and a product loading facility will be installed during seasons 2, 3, and 4. Installation of the gas pipeline is planned for seasons 3 and 4 as well.

The number of sea otters takes by year was then estimated by allocating the total expected take by proportion of each project component occurring in each year. For example, the 2D seismic surveys are planned for year 3, so all takes during 2D seismic surveys were assigned to year 3. The resulting estimates of total Level B take by year are shown in table 12.

TABLE 11—NOISE-GENERATING ACTIVITIES BY YEAR. ACTIVITIES ARE THOSE WITH SOURCE LEVELS ABOVE 160 dB rms WITHIN FREQUENCIES HEARD BY SEA OTTERS

Year	Applicant	Activity	Area
2019: Season 1	Hilcorp/Harvest	3D seismic	LCI
		NCI geohazard surveys	LCI
		Pipeline maintenance (geohazard, water jet)	MCI
2020: Season 2	Hilcorp/Harvest	2D seismic	LCI
		Drilling activities (geohazard, pipe driving, VSP) at 1 well	LCI
		Drilling activities (geohazard, pipe driving, VSP) at 2 wells in TB	MCI
		Plug and abandon activities (geohazard) at 1 well in the NCI	MCI
		Pipeline maintenance (geohazard, water jet)	MCI
		Sheet pile driving at TMOF	MCI
2021: Season 3	Hilcorp/Harvest	Drilling activities (geohazard, pipe driving, VSP) at 2 wells	LCI
		Sheet pile driving in Chinitna Bay	LCI
	AGDC	Pipeline maintenance (geohazard, water jet)	MCI
		Sheet pile driving at MMOF	MCI
		Sheet pile driving at MMOF	MCI
2022: Season 4	Hilcorp/Harvest	Drilling activities (tugs, geohazard, pipe driving, VSP) at 1 well	LCI
		Pipeline maintenance (geohazard, water jet)	MCI
	AGDC	Impact pile driving at PLF: 80 48-inch piles, 63 60-inch piles	LCI
		Anchor handling for pipeline installation	MCI
2023–2024: Season 5 ...	Hilcorp/Harvest	Pipeline maintenance (geohazard, water jet)	MCI
		Impact pile driving at PLF: 40 48-inch piles, 80 60-inch piles	LCI
	AGDC	Impact pile driving at PLF: 10 48-inch piles, 48 60-inch piles	LCI

TABLE 11—NOISE-GENERATING ACTIVITIES BY YEAR. ACTIVITIES ARE THOSE WITH SOURCE LEVELS ABOVE 160 dB rms WITHIN FREQUENCIES HEARD BY SEA OTTERS—Continued

Year	Applicant	Activity	Area
		Anchor handling for pipeline installation	MCI

LCI = Lower Cook Inlet, MCI = Middle Cook Inlet, NCI = North Cook Inlet, TB = Trading Bay, PLF = product loading facility, TMOF = temporary material offloading facility, MMOF = mainline material offloading facility, VSP = vertical seismic profiling.

TABLE 12—ESTIMATES OF TOTAL NUMBER OF TAKES BY LEVEL B HARASSMENT BY YEAR (OR PROJECT SEASON)

Take	Year (Project season)				
	2019 (Season 1)	2020 (Season 2)	2021 (Season 3)	2022 (Season 4)	2023 (Season 5)
Takes by year (season)	877	800	2	3	2
% takes by year (season)	52%	48%	0%	0%	0%

Critical Assumptions

In order to conduct this analysis and estimate the potential amount of take, several critical assumptions were made. Here we discuss these assumptions, the potential sources of bias or error inherent in them, and their effects on the analysis. Take by harassment is equated herein with exposure to noise meeting or exceeding the specified criteria. We assume all otters exposed to these noise levels will exhibit behavioral responses that indicate harassment or disturbance. There are likely to be a proportion of animals that respond in ways that indicate some level of disturbance but do not experience significant biological consequences. A correction factor was not applied. This may result in overestimation in take calculations from exposure to underwater noise, while our separate assumption that sea otters exposed to noise in the air but not in the water do not independently experience harassment may result in underestimation of take. The net effect is unknown.

Our estimates do not account for variable responses by age and sex. Females with dependent pups and with pups that have recently weaned are physiologically the most sensitive (Thometz *et al.* 2014) and most likely to experience take from disturbance. There is not enough information on composition of the Cook Inlet sea otter population in the applicant’s project area to incorporate individual variability based on age and sex or to predict its influence on take estimates. We therefore assume the response rates are uniform throughout the population. The degree of over- or under-estimation of take is unknown.

The estimates of behavioral response presented here do not account for the individual movements of animals away

from the project area due to avoidance or habituation. Our assessment of density does not change. There is not enough information about the movement of sea otters in response to specific disturbances to refine these assumptions. While otters do have restricted movements and smaller home ranges than other marine mammals and, therefore, are likely to be exposed to sound during multiple days of work, it is unlikely that all otters will continue to respond in the same manner. Otters may remain in the area, depart from the area and return after activities are complete, or habituate to the disturbance and no longer experience take. However, we have no data to adjust for the likelihood of departure or habituation. In general, this situation is likely to result in overestimation of the number of takes. However, we also considered whether it would underestimate the impact of take because the same animal may be taken multiple times. For most animals, the effects of each repeated disturbance will be a short-term change in behavior which will have no lasting effect on the animal’s survival or reproductive capacity. For a few animals, there may be more severe consequences. The net effect of this assumption is overestimation of take.

We do not account for an otter’s time at the water’s surface where sound attenuates faster than in deeper water. The average dive time of a northern sea otter is only 85 to 149 seconds (Bodkin *et al.* 2004; Wolt *et al.* 2012). Wolt *et al.* (2012) found Prince William Sound sea otters average 8.6 dives per feeding bout, and when multiplied by the average dive time (149 sec), the average total time a sea otter spends underwater during a feeding bout is about 21 minutes. Bodkin *et al.* (2007) found the overall average activity budget

(proportion of 24-hour day) spent foraging and diving was 0.48 (11.4 hours per day), and 0.52 nondiving time (12.5 hours per day). Gelatt *et al.* (2002) found that the percent time foraging ranged from 21 percent for females with very young (less than 3 weeks of age) dependent pups to 52 percent for females with old (greater than or equal to 10 weeks of age) pups. Therefore, although exposure to underwater sound during a single dive is limited, accumulation of exposure over time is expected. Our assessment may cause some overestimation in this regard.

We also assume that the mitigation measures presented will be effective for avoiding some level of take. However, additional information is needed to quantify the effectiveness of mitigation. The monitoring and reporting in this ITR will help fill this information need in the future, but for this suite of planned activities, no adjustments were made to estimate the number of takes that will be avoided by applying effective mitigation measures. This scenario leads to overestimation in calculation of take.

The current project description represents the applicant’s best expectation of how, where, and when work will proceed. We expect that the current project description is an accurate depiction of the work that will be conducted. Details provided in future applications for LOAs under this regulation must provide accurate project details, which may include minor changes from those described here. Minor changes to the details of the specified activities, such as a change of the specific vessels or a change in the start date of a specific activity, are not expected to significantly change the overall estimates of take or the conclusions reached in our analysis. In all cases, the most accurate information

about the project and the specific estimation parameters will be used, along with methods that are consistent with those described here, to calculate the effects of the activities and to ensure that the effects remain concordant with the determinations of this rulemaking. Larger project changes that result in significantly different effects on sea otters would be outside of the scope of this ITR.

Potential Impacts on Sea Otter Stocks

The estimated number of takes by Level B harassment is 1,684 instances of take due to behavioral responses or TTS associated with noise exposure. Among otters from the southwest Alaska stock, 417 Level B takes are expected; and among the southcentral Alaska stock, 1,267 takes from Level B harassment are expected. The estimated number of takes by Level A harassment is one from the southwest Alaska stock and two instances of take from the southcentral Alaska stock due to PTS associated with noise exposure. Combined, the expected number of Level A and Level B takes is 418 takes from the southwest Alaska stock and 1,269 takes from the southcentral Alaska stock.

These levels represent a small proportion relative to the most recent stock abundance estimates for sea otters. The estimated 418 takes is 0.9 percent of the best available estimate of the current population size of 45,064 animals in the southwest Alaska stock (USFWS 2014a) ($418 \div 45,064 = 0.009$). The estimate of 1,269 takes is about 6.9 percent of the 18,297 animals in the southcentral Alaska stock (USFWS 2014b) ($1,269 \div 18,297 = 0.069$). For these analyses, we are emphasizing the total number of takes rather than the number of animals taken. At this time, there are insufficient data regarding the daily movement patterns of individual sea otters in Cook Inlet to support an estimate of the number of animals taken. Evaluation based on total take in this situation is certain to be an overestimate of the actual impact, but it avoids relying on an estimate of number of animals taken that is precise, but possibly incorrect.

Sea otters exposed to sound produced by the project are likely to respond with temporary behavioral modification or displacement. Project activities could temporarily interrupt the feeding, resting, and movement of sea otters. Because activities will occur during a limited amount of time and in a localized region, the impacts associated with the project are likewise temporary and localized. The anticipated effects are primarily short-term behavioral

reactions and displacement of sea otters near active operations.

Animals that encounter the specified activities may exert more energy than they would otherwise due to temporary cessation of feeding, increased vigilance, and retreat from the project area. We expect that affected sea otters would tolerate this exertion without measurable effects on health or reproduction. Most of the anticipated takes would be due to short-term Level B harassment in the form of TTS, startling reactions, or temporary displacement. Three instances of Level A take are expected to occur due to PTS. The effects of PTS in sea otters are unknown.

With the adoption of the measures proposed in the applicant's 4MP and required by this ITR, the amount and likelihood of Level A and Level B take will be reduced. The number of otters affected will be small relative to the stocks, and the overall effect on the stocks is expected to be negligible.

Potential Impacts on Subsistence Uses

The planned oil and gas activities will occur near marine subsistence harvest areas used by Alaska Natives from the villages of Ninilchik, Seldovia, Tyonek, Nanwalek, Seldovia, and Port Graham. Between 2013 and 2018, approximately 491 sea otters were harvested for subsistence use from Cook Inlet, averaging 98 per year. The large majority were taken in Kachemak Bay. Harvest occurs year-round, but peaks in April and May, with about 40 percent of the total taken at that time. February and March are also high harvest periods, with about 10 percent of the total annual harvest occurring in each of those months. The project area will avoid Kachemak Bay and therefore avoid significant overlap with subsistence harvest areas. The applicant's activities will not preclude access to hunting areas or interfere in any way with individuals wishing to hunt. Vessels, aircraft, and project noise may displace otters, resulting in changes to availability of otters for subsistence use during the project period. Otters may be more vigilant during periods of disturbance, which could affect hunting success rates. The applicant will coordinate with Alaska Native villages and Tribal organizations to identify and avoid potential conflicts. If any conflicts are identified, the applicant will develop a POC specifying the particular steps that will be taken to address any effects the project might have on subsistence harvest. A POC will be prepared for 3D surveys planned by Hilcorp and Harvest.

Findings

Small Numbers

For small numbers analyses, the statute and legislative history do not expressly require a specific type of numerical analysis, leaving the determination of "small" to the agency's discretion. The statutory definition is provided at 16 U.S.C. 1362; however, the Service no longer relies upon or applies this regulatory definition. The Court of Appeals for the Ninth Circuit (*Center for Biological Diversity v. Salazar*, 695 F.3d 893, 902–907 [9th Cir. 2012]) has determined that the regulatory definition conflates "small numbers" with "negligible impact," whereas the MMPA establishes these as separate standards.

Our small numbers analysis evaluates whether the number of marine mammals anticipated to be taken is small relative or proportional to the size of the overall population. A more precise formulation of "small numbers" is not possible because the concept is not capable of being expressed in absolute numerical limits. The Court of Appeals for the Ninth Circuit has expressly approved this type of analytical approach (*Center for Biological Diversity v. Salazar*, 695 F.3d at 905–907).

To evaluate whether the specified oil and gas activities in Cook Inlet would affect small numbers, we calculated the number of instances of take that are predicted to result from the specified activities. We then used the number of takes as a conservative estimate of the number of animals taken to determine whether more than a small number would be taken when compared with the size of the stock. We found that the proposed project may result in approximately 1,687 takes, of which, 418 takes will be from the southwest Alaska stock and 1,269 takes will be from the southcentral Alaska stock. Based on most recent stock assessments (USFWS 2014a, b), the number of takes would equal about 1 percent of the southwest Alaska stock and 6.9 percent of the southcentral Alaska stock.

Evaluation based on total take rather than numbers of animals taken, is certain to be an overestimate of the actual impact because some otters are likely to be taken multiple times during the work. We determined it was appropriate to consider total take for these analyses as the best available data regarding the daily movement patterns of sea otters because there was not sufficient information to support an accurate estimate of the number of individual animals affected by the specific project activities. The available

information suggests that only a portion of the estimate of take will be realized. Based on these numbers, we find that the applicant's activities will take, by harassment, only a small number of animals relative to the population sizes of the affected stocks.

Negligible Impact

We find that any incidental take by harassment resulting from the proposed project cannot be reasonably expected to, and is not reasonably likely to, adversely affect the sea otter through effects on annual rates of recruitment or survival and would, therefore, have no more than a negligible impact on the species or stocks. In making this finding, we considered the best available scientific information, including: The biological and behavioral characteristics of the species, the most recent information on species distribution and abundance within the area of the specified activities, the potential sources of disturbance caused by the project, and the potential responses of animals to this disturbance. In addition, we reviewed material supplied by the applicant, other operators in Alaska, our files and datasets, published reference materials, and species experts.

Sea otters are likely to respond to specified activities with temporary behavioral modification or displacement. These reactions are unlikely to have consequences for the health, reproduction, or survival of most affected animals. Most animals will respond to disturbance by moving away from the source, which may cause temporary interruption of foraging, resting, or other natural behaviors. Affected animals are expected to resume normal behaviors soon after exposure, with no lasting consequences. Some animals may exhibit more severe responses typical of Level B harassment, such as fleeing, ceasing feeding, or flushing from a haulout. These responses could have significant biological impacts for affected individuals. Three otters may experience Level A take from PTS. The effects to these individuals are unknown, but lasting effects to survival and reproduction are possible. Thus, although the specified activities may result in approximately 418 takes from the southwest Alaska stock and 1,269 takes from the southcentral Alaska stock, we do not expect this level of harassment to affect annual rates of recruitment or survival or result in adverse effects on the species or stocks. The focus on total take, rather than number of animals taken, for these

analyses provides an overestimate of the effects on stocks.

Our finding of negligible impact applies to incidental take associated with the specified activities as mitigated by the avoidance and minimization measures identified in the applicant's 4MP. Minimum flight altitudes will help operators avoid take from exposure to aircraft noise. Protected species observers and procedures implemented by PSOs will limit Level A take during seismic work and pile driving. Collision-avoidance measures, including speed reductions when otters are present, will ensure that boat strikes are unlikely. These mitigation measures are designed to minimize interactions with and impacts to sea otters and, together with the monitoring and reporting procedures, are required for the validity of our finding and are a necessary component of the ITR. For these reasons, we find that the specified activities will have a negligible impact on sea otters.

Impact on Subsistence

We find that the anticipated harassment caused by the applicant's activities will not have an unmitigable adverse impact on the availability of sea otters for taking for subsistence uses. In making this finding, we considered the timing and location of the specified activities and the timing and location of subsistence harvest activities in the area of the proposed project. We considered the comments received during the public comment period. We also considered the applicant's consultation with subsistence communities, proposed measures for avoiding impacts to subsistence harvest, and commitment to development of a POC for project components that could have any adverse impact on subsistence harvest. We based our finding on: (1) Initial results of community outreach conducted by the applicant and the Service; (2) the results of aerial surveys indicating the availability of sea otters in Cook Inlet; (3) locations of hunting areas; and (4) the limited potential for overlap of hunting areas and proposed projects. The Service's confirms that through the coordination process identified in the ITR, no take of sea otters will be authorized that will result in an unmitigable adverse impact on the availability of sea otters for subsistence harvest sufficient to meet the needs of coastal dwelling Alaskan Natives.

Least Practicable Adverse Impacts

We find that the mitigation measures required by this ITR will effect the least practicable adverse impacts from any incidental take likely to occur in

association with the specified activities. In making this finding, we considered the biological characteristics of sea otters, the nature of the specified activities, the potential effects of the activities on sea otters, the documented impacts of similar activities on sea otters, and alternative mitigation measures.

Monitoring and Reporting

The purposes of the monitoring requirements are: To document and provide data for assessing the effects of specified activities on sea otters; to ensure that take is consistent with that anticipated in the small numbers, negligible impact, and subsistence use analyses; and to detect any unanticipated effects on the species. Monitoring plans include steps to document when and how sea otters are encountered, and their numbers and behaviors during these encounters. This information allows the Service to measure encounter rates and trends and to estimate numbers of animals potentially affected. To the extent possible, monitors will record group size, age, sex, reaction, duration of interaction, and closest approach to the project activity.

Monitoring activities will be summarized and reported in a formal report each year. The applicant must submit an annual monitoring and reporting plan at least 90 days prior to the initiation of the activity, and the applicant must submit a final monitoring report to us no later than 90 days after the expiration of the LOA. We base each year's monitoring objective on the previous year's monitoring results. We require an approved plan for monitoring and reporting the effects of oil and gas industry activities on sea otters prior to issuance of an LOA. We require approval of the monitoring results for continued operation under the LOA.

We find that this regulation will establish monitoring and reporting requirements to evaluate the potential impacts of planned activities and to ensure that the effects of the activities remain consistent with the rest of the findings.

Summary of and Response to Comments and Recommendations

During the public comment period, we requested written comments from the public on the proposed ITR as well as the draft EA. The comment period on the proposed ITR opened on March 19, 2019 (84 FR 10224), and, in response to requests from the public, was extended on April 5, 2019 (84 FR 13603). The comment period closed on April 19,

2019. We received 20 submissions; these included comments on the proposed rule and the draft EA as well as a number of publications and other documents submitted in support of those comments.

The Service received comments from the Marine Mammal Commission, industry organizations, environmental organizations, local government entities, Tribal organizations, and the public. We reviewed all comments received for substantive issues, new information, and recommendations regarding the proposed ITR and the draft EA. The comments are aggregated by subject matter, summarized and addressed below, and changes have been incorporated into the final rule as appropriate. A summary of the changes to this final ITR from the proposed ITR is found in the preamble section entitled, Summary of Changes from the Proposed Rule.

General Comments

Comment 1: Several commenters opposed the promulgation of the ITR based on a general opposition to oil and gas industry activities.

Response 1: Language within section 101(a)(5)(A) of the MMPA requires the Service to allow the incidental taking of small numbers of marine mammals provided the Service has made certain determinations regarding the specified activity. Once we make the required determinations, we must promulgate the ITR. It is not our role in this process to approve or deny the specified activities. Our mandate is to identify and assess the potential impact of those activities on marine mammals, and if our analysis concludes that such impacts are consistent with the required determinations, we must promulgate an ITR.

Comment 2: Allowing any level of harassment is a threat to the species.

Response 2: We disagree. Based on our analysis we found that the effects of the specified activities will have no more than a negligible impact upon a small number of northern sea otters in Cook Inlet.

Comment 3: There is insufficient information on how sound affects sea otters to determine the risks to the species; more research should be done.

Response 3: While we acknowledge that additional research is needed to refine the evaluation of the effects of sound exposure on sea otters, we disagree with the comment that available information limits the Service's ability to conduct the required analysis and make the required determinations, which are based on the

best scientific information that is available.

Comment 4: The project actions will harm beluga whales.

Response 4: The effects to marine mammals other than sea otters are outside of the scope of this rule and the authority of the Service. The NMFS has jurisdiction over issuance of incidental take of beluga whales and other cetacean and pinniped species in Cook Inlet.

Comment 5: Seismic surveys can harm fish and invertebrates, thereby impeding prey availability and foraging for sea otters.

Response 5: The Service evaluated effects of the proposed seismic surveys on sea otter prey availability to determine whether these effects would lead to incidental take of otters. See Potential Effects of the Activities, *Effects on Habitat and Prey*. As discussed in this final rule, the expected effects of the planned seismic surveys on sea otter prey will not result in lasting consequences for prey availability or additional take of sea otters.

Project Description

Comment 6: The description of activities considered for the ITR is ambiguous. The Service should address these ambiguities and ensure that the ITR is very specific about what the applicant can and cannot do to make sure the LOA process is not open-ended.

Response 6: We disagree. Consistent with numerous previous ITRs, this ITR provides an overall "umbrella" set of requirements which, when followed, allow the incidental take of small numbers of sea otters during certain oil and gas industry activities. The requirements ensure that there is no more than a negligible impact on these species, the activities will have the least practicable adverse impacts, and that there will not be unmitigable impacts on the availability of these species for subsistence use. The Service believes we have used the appropriate level of detail necessary to evaluate the effects of the specified activities within the 5-year period of the ITR consistent with requirements of the MMPA.

Comment 7: Several commenters pointed out inconsistencies between the project descriptions and the description of activities in the proposed ITR.

Response 7: We verified the project descriptions with the applicant and revised the project descriptions as needed in this final rule.

MMPA Requirements

Comment 8: The public comment period should be extended; although it

was extended from 15 to 30 days, it was still too short.

Response 8: The Service determined that a 30-day comment period would be sufficient for this rulemaking.

Comment 9: The Service should evaluate the harm and harassment of the proposed action on units smaller than stocks.

Response 9: The Service believes that our evaluation of the proposed activities at the stock level is consistent with section 101(a)(5) of the MMPA, which uses the term "species or stock." We do not believe an evaluation at a larger or smaller scale is appropriate.

Comment 10: Several commenters expressed concern that industry activities and incidental take authorization could have an adverse impact on Alaska Native subsistence use of sea otters. It was suggested that the Service should ensure that all applicants submit, as part of their LOA requests, a site-specific stakeholder engagement plan or POC that includes a summary of input received, a schedule for ongoing community engagement, and measures that would be implemented to mitigate any potential conflicts with subsistence hunting.

Response 10: This ITR requires an LOA applicant to coordinate with Alaska Native villages and Tribal organizations to identify and avoid potential conflicts. If any conflicts are identified, the applicant must develop a POC specifying the particular steps that will be taken to address any effects the project might have on subsistence harvest. Appropriate mitigation measures will be developed if conflicts are identified. The applicant must conduct stakeholder engagement and make this information available to the Service. Revisions have been made to §§ 18.134(b)(3) and 18.140(b) to incorporate these suggestions and provide additional detail and clarity regarding the required components of the stakeholder engagement plan and POC.

Comment 11: Neither the applicant nor the Service consulted with federally recognized tribes or tribal organizations on this proposed activity.

Response 11: We conducted outreach to all the tribal organizations in the Cook Inlet region by email and postal letters. We received one response requesting further consultation on this project from the Native Village of Chickaloon. No other groups expressed interest. When the Chickaloon Village Traditional Council (CVTC) and the Service were not able to schedule a time and place suitable to both parties to conduct the consultation, the CVTC chose to provide written comments to

the Service expressing their views on the ITR. See *Comment 1* for our response.

Comment 12: The Service conflates small numbers and negligible impact standards required by the MMPA.

Response 12: We disagree. As we explain in the preamble of this ITR, we do not rely upon the definition of “small numbers” found in 50 CFR 18.27 as it conflates “small numbers” with “negligible impacts.” We recognize “small numbers” and “negligible impacts” as two separate and distinct requirements under the MMPA. The Service maintains that the proposed oil and gas activities in Cook Inlet will affect a small number of animals and will have a negligible effect on the stocks, based on separate and discrete analyses for each of these criteria.

Comment 13: The conclusions in the proposed ITR that the activities will have a negligible impact and take only small numbers are insufficiently supported.

Response 13: We disagree. The Service analysis of the specified activities for this ITR used the best available information and encapsulated all of the applicant’s known and anticipated activities that will occur in the Cook Inlet ITR Region during the 5-year period of this ITR.

Comment 14: Cumulative impacts of multiple take authorizations in Cook Inlet must be considered.

Response 14: In our negligible impacts assessment, we considered the effects of a suite of human activities on sea otters in Cook Inlet, including impacts from noise, vessel activities, human encounters, oil spills, cumulative effects of existing and future development, production, and exploration activities, and the likelihood of impacts from these activities. We incorporated these impacts into the baseline condition of the affected stocks to determine whether the issuance of take would have more than a negligible effect.

Estimation of Take

Comment 15: The analysis does not adequately address effects of noise on mothers with pups.

Response 15: While we acknowledge that mothers with pups are likely to be among the most sensitive individuals to harassment, we believe our analysis adequately addresses potential impacts to all life stages as discussed in the preamble.

Comment 16: The estimates of numbers of takes and sea otters taken do not correctly allocate the proportion of takes between the southcentral and southwest Alaska stock resulting in

underestimation of take from the ESA-listed southwest Alaska stock. Methods used to allocate take between stocks are insufficiently supported. The assignment of the Level A take to the southcentral Alaska stock is arbitrary.

Response 16: We disagree. Take is calculated according to the location, duration, and intensity of the specific component of the work, and the density of sea otters exposed to work in that project area. Estimates of the number of takes was based on the proportion of each activity occurring within each stock boundary. For clarity, we have added a table showing what proportion of each activity is expected to occur within each stock boundary.

In response to this comment, we reevaluated whether the allocation of Level A take was assigned to the appropriate stock. We determined that the appropriate procedures were used to estimate Level A take according to location and characteristics of the activity within each stock boundary. However, we acknowledge that it is more appropriate in this case to consider the total number of takes rather than the number of animals taken. This change resulted in revision of the Level A take estimate from three takes of one animal in the southcentral Alaska stock, to two instances of take from the southwest Alaska stock and one instance of take from the southcentral Alaska stock. Although we determined in this final regulation that it was more appropriate to use total takes rather than takes of animals, the proposed regulation, which presented both methods for considering take, was not arbitrary.

Comment 17: Take is underestimated, and methods of take calculation are not adequately disclosed.

Response 17: Take was calculated based on the best information available at the time of the analysis and was done in a manner that any necessary assumptions or estimates in input parameters would result in overestimation of take rather than underestimation. We have added additional text and an additional table to Estimated Incidental Take to help describe how these take estimates were calculated.

Comment 18: The Service proposed that a very small number of sea otters could be taken by Level B harassment relative to the estimated number of sea otter takes. The number of individuals estimated to be taken during the course of the regulations is unrealistic based on the types of activities being conducted and the location and duration of those activities. Mobile activities, such as seismic and geohazard surveys, would

be conducted over a large area and an extended period of time, resulting in the exposure of more individuals than would be exposed for stationary sources, such as pile driving.

Response 18: We employed a model for estimating the number of animals taken based on the estimated number of takes. This model was based on the available information at the time of the analysis. We recognize that a more sophisticated model can be developed but, at this time, there are insufficient data regarding the behaviors and movement patterns of individual sea otters in Cook Inlet, and so we cannot be confident that a more sophisticated model would accurately translate the total number of takes into a more accurate estimate of the number of animals taken. Therefore, rather than attempting to recalculate the number of animals taken using a more sophisticated model that may be no more accurate, we instead emphasize the importance of the total number of takes in this final rule. We have evaluated whether the MMPA determinations can be made based on the total number of takes rather than solely on the number of animals taken in order to ensure that our assessments do not underestimate the possible impacts to the stocks. This approach has been used in previous analyses of incidental take of marine mammals, both explicitly and implicitly, when a suitable estimate of numbers of individuals could not be derived from available information (e.g., 81 FR 52276, August 5, 2016; 81 FR 40902, June 23, 2016). Using total take to evaluate the effects of the specified activities on sea otters in Cook Inlet is likely to be an overestimate of the actual impact, but it avoids relying on an estimate of number of animals taken that is precise, but possibly incorrect.

Comment 19: The proposed pile-driving activities will harm and harass sea otters beyond the minimal estimates provided by the Service.

Response 19: We have determined that in the proposed ITR, we underestimated the duration of pile-driving activities, but in cooperation with the applicant, we have incorporated more accurate estimates of the time needed to complete these activities to ensure the effects are not underestimated. Further, the effects of specific pile driving activities will be evaluated in individual LOAs to ensure accurate project details are incorporated.

Comment 20: The Service incorrectly concludes that harassing the same nine threatened sea otters 410 times will be inconsequential.

Response 20: The comment misinterprets our analysis in three ways. As discussed in the response to *Comment 18*, the estimate of number of animals taken was based on a model derived from the total number of takes. However, for this suite of projects, the number of takes is a more accurate assessment of the total impact of the activity, and our assessment has been revised to reflect this. Secondly, for most animals, the effects of disturbance will be short-term changes in behavior, which will have no lasting effect on the animal's survival or reproductive capacity. While there may be more severe consequences for a few animals, our evaluation supports a determination that there will be no significant consequences on the stocks to which these animals belong, not that the effects to individual animals are inconsequential. Finally, there is an implied omission of assessment of repeated exposures. We addressed this issue in the text of the preamble in Potential Effects of the Activities and Characterizing Take.

Comment 21: Airborne noise: The Service conflates exposures from underwater sound sources with disturbing activities that do not generate underwater sound. The proposed rule discounts the impacts of noise in the air. The Service's conclusion that all take from aerial surveys will be mitigated is arbitrary, and instead it must analyze the potential for take from all sources of air traffic associated with the activities.

Response 21: We disagree. We evaluated the full suite of project activities to determine which are likely to cause sea otters to react in ways that indicate take by Level A and Level B harassment. Take from airborne noise was considered. We assessed the likelihood, frequency, and severity of Level A and Level B take from airborne noise. Further discussion of this issue can be found in the section on Airborne Sounds in Effects of Noise.

Comment 22: The Service relies on avoidance to reduce sea otter take; however, this is arbitrary and capricious because displacement still amounts to harassment and even harm if it impedes a sea otter from foraging or resting in its preferred habitat.

Response 22: The commenter has misinterpreted how take associated with displacement is characterized and estimated in this rule. Displacement indeed does constitute take if, as the commenter notes, it impedes a sea otter from foraging or resting in preferred habitat and, as we note, the resulting effort to forage or rest in suboptimal habitat results in a biologically significant affect to the animal. Not all

displacement will cause take. Otters displaced to other areas of suitable habitat and otters that are displaced, but do not experience a biologically significant interruption in feeding or resting are not considered taken. The analysis of take includes all animals exposed to the specified activities that are expected to respond with behaviors that indicate a Level A or Level B take has occurred, including displacement leading to biologically significant interruption in feeding and resting. We used the best available evidence based on the biological characteristics and behaviors of sea otters, or a suitable proxy, and the characteristics of the planned activities to identify appropriate thresholds of exposure that are likely to result in take. We have identified and used the same thresholds for northern and southern sea otters in previous analyses (e.g., 83 FR 18077, April 25, 2018; 82 FR 6627, January 19, 2017, 83 FR 18330, April 26, 2018). Where information was lacking, we used conservative assumptions to ensure take, including that associated with displacement, was not underestimated. In sum, take from displacement was incorporated in this analysis, and the characterization of take associated with such displacement was neither arbitrary nor capricious.

Comment 23: Seismic surveys will likely affect marine mammals in a much larger area than anticipated by the application.

Response 23: We disagree. While the proposed survey may be detectable to sea otters beyond the thresholds for take that we identified here, to constitute take by harassment, the effects of exposure must rise beyond detectability to cause a biologically significant disruption of behavior. Many animals will have non-significant responses, including short term increases in vigilance, momentary startle responses, or short-term changes in body orientation or direction of travel. To distinguish between non-significant responses and those indicating take, the Service has used an exposure threshold of 160 dB for underwater noise. See the comments regarding use of a 120-dB threshold versus a 160 dB threshold (*Comment 33*) for more discussion on the suitability of this threshold.

Comment 24: The upper end of the frequency of hearing for sea otters should be 38 kHz rather than 32 kHz.

Response 24: We agree. This correction was made in the ITR.

Comment 25: Two commenters pointed out that the proposed ITR evaluated vessel noise from tugs towing rigs but did not evaluate noise from transiting vessels and suggested that, if

general vessel use is discounted as a source of potential harassment, use of the tug should be as well.

Response 25: Tugs towing a rig are using high-powered engines and are often working in teams, resulting in higher levels of underwater noise than is typical of most vessel traffic. Tugs will be towing rigs to areas in Cook Inlet where these activities are unusual. Otters in these areas may show a greater level of vigilance or avoidance of these activities than for most vessel traffic due to the novelty of the activity in that area. We do not typically consider vessel traffic to have the potential to result in take, but the applicant had initially requested authorization of take that may occur during tug towing. The Service evaluated the expected number of takes associated with tug towing and found this activity would likely result in less than one take. Accordingly, the applicant has since removed this request from its application and the Service has removed tug towing from the activities included in the final rule.

Comment 26: Anchor handling, pipe cutting, and grinding do not emit sound levels sufficiently high to cause Level A or B harassment and should not be included in the analyses.

Response 26: For activities with source levels nearing take thresholds, the possibility of take was analyzed at the request of the applicant and included in the overall take estimate in the proposed rule. Results of our analyses indicated that take associated with these activities is negligible. The applicants have since requested withdrawal of grinding and pipe cutting from consideration but have maintained inclusion of anchor handling. These changes are reflected in this rule.

Comment 27: Several commenters expressed that a 160-dB re 1 μ Pa threshold is inadequate as it addresses only acoustic harassment and does not account for takes resulting from behavioral changes, particularly for continuous, non-impulsive sound sources.

The Marine Mammal Commission recommended that, until such time that the 120- and 160-dB re 1 μ Pa thresholds are updated, the Service use a 120-rather than 160-dB re 1 μ Pa threshold to estimate the extents of the Level B harassment zones and numbers of sea otter takes when non-impulsive, continuous sources are proposed for use. The Commission further recommended that, if the Service did not use a 120-dB threshold, then a 141-dB Level B harassment threshold should be used for non-impulsive, continuous sources based on monitoring data from

the Elkhorn Slough National Estuarine Research Reserve (ESNERR) (2011).

Response 27: The highest spectral densities for noises generated by vibratory pile driving lie within a range of frequencies at which sea otters have poor hearing ability. In contrast, gray whales, on which the 120-dB threshold is based, are highly sensitive to sounds within this frequency range. We do not dispute that sea otters may hear and may react to sounds produced by vibratory pile driving. However, we maintain that it is unlikely that sea otters' reactions will be equivalent to those of gray whales in terms of the sound levels that elicit reactions equivalent to take by harassment. Thus, it is not appropriate to apply the 120-dB threshold to sea otters.

The Service disagrees with the Commission's conclusions regarding ESNERR (2011). After considering the Commission's comments and reviewing the monitoring data (ESNERR 2011 and ESNERR unpublished data 2018), we reaffirm our statement that "project-related monitoring of sea otter behavior in areas exposed to underwater sound levels ranging from approximately 135–165 dB during vibratory pile driving (ESNERR 2011) showed no clear pattern of disturbance or avoidance in relation to these levels of underwater sound exposure."

As such, we maintain that use of a 160-dB threshold for both impulsive and non-impulsive sounds is consistent with the best available information.

Comment 28: The tables summarizing source levels, repetition rates, pulse durations, weighting factor adjustments, and other assumptions for survey instruments were incorrect or inappropriate.

Response 28: Discrepancies or errors of the source levels and other parameters for sound sources have been corrected in this rule.

Comment 29: The Commission recommended that chirps have temporal and spectral characteristics suggesting that a lower, more precautionary Level B harassment threshold of 120 dB would be more appropriate than the 160-dB threshold. The Commission further recommended that, until the behavior thresholds are updated, the Service requires applicants to use the 120- rather than 160-dB threshold for intermittent, non-impulsive sources (such as chirps).

Response 29: The Service considers sub-bottom profilers, including chirps, to be impulsive sources. Continuous sounds are characterized by having a sound pressure level that consistently stays above ambient levels and negligible fluctuations (NIOSH 1998;

ANSI 2005). Intermittent sounds, with cyclical periods of lower or no sound level, can further be classified as either impulsive or non-impulsive. Impulsive sounds are brief (less than 1 second) and transient, with rapid rise time to a high peak pressure followed by a rapid decay (ANSI 1986; NIOSH 1998). Non-impulsive sounds have more gradual rise times and gradual decays. Sounds from sub-bottom profilers more closely resemble impulsive sounds, as opposed to non-impulsive or continuous sounds, and the Service treats them as such.

Regardless of how sounds emitted by chirps are classified, the references cited by the Commission in support of use of a 120dB threshold are overwhelmingly based on cetaceans in the high-frequency and mid-frequency functional hearing groups (harbor porpoise, killer whale, beaked whale, sperm whale, *Lagenorhynchus* and *Stenella* dolphins). These animals have significantly greater sensitivity to and utilization of high frequency sounds, therefore the results of those studies are not applicable to sea otters.

Comment 30: The Commission strongly suggested that the Service consult with NMFS regarding the appropriateness of the various thresholds. The Commissions also recommended that the Service take a more active role in the development, review, and implementation of any and all acoustic and behavior thresholds for marine mammal species under its jurisdiction and consult with NMFS on whether, when, and how NMFS' current thresholds should be implemented.

Response 30: The Service responded to the Commission's previous letters and advice consistent with our repeated response here. The Service continues to evaluate impacts resulting from anthropogenic sound on marine mammals under our jurisdiction using the best available information. We are aware of and supportive of the efforts by NMFS and its Science Centers to develop their Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing Acoustic Guidelines for those species under NMFS' jurisdiction. Although the Service provided informal comments on an early version of these guidelines, we did not provide additional comments because the guidance is specific to management of species under the jurisdiction of the Department of Commerce. The Service will continue to work with our partners, including the U.S. Geological Survey and NMFS, to obtain the best scientific information concerning potential effects of anthropogenic sound on marine mammal species under our jurisdiction.

Mitigation and Monitoring Comments

Comment 31: Several commenters indicated the need for additional Protected Species Observers to monitor Level A and B harassment zones.

Response 31: The issuance of an LOA for the specific activities under this ITR is contingent upon an applicant developing and implementing a detailed monitoring plan to ensure that the effects of the activities on marine mammals are documented and reported. If the monitoring plan is incomplete, inadequate, or not implemented, the LOA will not be issued, or if issued, may be rescinded.

Effective monitoring is a necessary component of this rule. An applicant for an LOA must submit, as part of the application, a detailed marine mammal monitoring and mitigation plan. It must include a sufficient number of PSOs to conduct visual project monitoring of 100 percent of a project's EZs during all daytime periods of underwater noise-generating work. Sea otters in the SZ must be documented and reported. These monitoring methods, included in this rule, were evaluated and found to be sufficient for detecting responses to project activities. We considered alternative monitoring methods and added a discussion of mitigation measures considered but not required in the section on the Mitigation and Monitoring.

Comment 32: The Service should clarify that ramp up procedures for vibratory pile driving differ from those for impact pile driving.

Response 32: Clarifying text has been added to § 18.137(b)(4)(ii).

Comment 33: Mitigation requiring shut downs to be accomplished within several seconds does not adequately consider worker health and safety, and equipment safety and integrity. The Service should consider modifying this language from "within several seconds" to "as soon as is practicable considering worker safety and equipment integrity".

Response 33: The suggested text has been added to § 18.137(b)(7)(ii).

Comment 34: Mitigation measures apply to "in-water work along the shoreline" however, this term is not defined. The Service should replace the phrase "in-water work along the shoreline" with "work occurring in intertidal areas."

Response 34: The suggested clarifying change was made to § 18.137(c)(2).

Comment 35: Hilcorp and Harvest's 4MP states that they plan to perform a sound source verification (SSV) for the 3D seismic survey in LCI and will work with the Service to determine if an SSV is needed for other activities occurring

in the project area. However, the Service did not include a requirement in the proposed rule for any applicant to conduct an SSV for any seismic or other activities. The Commission recommended that the Service require the applicant to conduct SSVs at the beginning of noise-generating activities for any sound sources for which in-situ measurements have not been made for similar activities in Cook Inlet and use those measurements to verify and adjust, if necessary, the extents of the Level A and B harassment zones.

Response 35: The omission of the SSV requirement for the 3D seismic survey in Cook Inlet is noted and has been corrected in this rule. We will work with the applicant to determine whether additional SSVs for other planned activities are appropriate and necessary.

Comment 36: The Service has proposed to use power-down procedures during seismic survey activities as an alternative to implementing a full shutdown when an animal is detected within or approaching the Level A harassment zone, which would necessitate a ramp-up of the full array. Power-downs also may be used at the operator's discretion to reduce the likelihood of a Level B harassment take. In a mitigation and monitoring workshop for seismic surveys, industry representatives indicated that power-downs may ultimately increase sound input to the marine environment due to the need to subsequently re-shoot the trackline to prevent gaps in data acquisition (unpublished workshop report cited in 82 FR 26255, June 6, 2017). For that reason and because a power down may not actually be useful, NMFS has prohibited the use of power-downs in its issuance of incidental harassment authorizations for taking of marine mammals associated with geophysical surveys in the Atlantic Ocean (83 FR 63350, December 7, 2018), which the Commission supported. The Commission therefore recommends that the Service prohibit using power-down procedures as a mitigation measure for seismic surveys in Cook Inlet.

Response 36: The Service agrees that, generally, it is best to minimize survey gaps and re-shoots. We disagree with the Commission's assertion that a voluntary power-down to avoid Level B take is not potentially useful.

In the instance of avoiding Level A take, mitigation is not voluntary. Either a power-down or a shutdown would interrupt survey activity to a degree that will create a survey gap requiring re-shoot. Regardless of which of the two options is applied, a duration of longer

than 10 minutes would require a ramp-up to restore the array to full power.

Survey gaps are undesirable to operators as they result in a loss of data continuity and there are significant costs associated with reshoots. The Service thinks it unlikely that an operator would choose to employ voluntary shutdowns either frequently or frivolously. In an encounter with an unusually large group of animals, a voluntary power-down may prevent exposure of a larger number of animals than would be exposed during infill shooting at a later time with typical encounter rates or group sizes. While we would encourage observers and operators to use voluntary power-downs as infrequently as is practicable, we feel that prohibition of this mitigation measure may ultimately result in an increase in exposure of marine mammals to noise.

Comment 37: The Service also would allow the use of a 10-in³ mitigation gun to avoid requiring operators to ramp up after the full array has not been in use (e.g., during a line turn, low-visibility conditions, or other short-term interruption of seismic survey activities). In its issuance of incidental harassment authorizations for taking of marine mammals associated with geophysical surveys in the Atlantic Ocean, NMFS required that the acoustic source be deactivated when not acquiring or preparing to acquire data, except as necessary for testing, and that unnecessary use of the acoustic source be avoided (83 FR 63351, December 7, 2018). The Commission supports that requirement for the reasons previously stated and recommends that the Service prohibit the use of a mitigation gun to avoid implementing ramp-up procedures.

Response 37: The Commission has mischaracterized the Service's proposed use of a mitigation gun; specifically, the proposed ITR did not suggest that ramp-up procedures may be avoided by use of a mitigation gun. Rather, we proposed use of a mitigation gun to reduce the probability of the presence of undetected animals within the SZ prior to initiation of ramp-up procedures during periods of poor visibility.

While it is true that IHAs recently issued by NMFS for seismic surveys in the Atlantic prohibited airgun use during line turns and other short-term interruptions of survey activities, the use of Passive Acoustic Monitoring (PAM) was authorized as an avenue to clear the SZ of marine mammals and initiate ramp-up procedures during times when the SZ would not be visible (e.g., at nighttime or during periods of rain or fog). The Service does not

believe PAM to be an effective monitoring and mitigation tool for Hilcorp and Harvest's proposed survey because (1) the high levels of ambient noise in Cook Inlet interfere with detections of underwater vocalizations; and (2) sea otters are not known to make underwater vocalizations. The Service contends that, within Cook Inlet, the use of a mitigation gun during line-change turns remains among the best practices to reduce the probability of animals being present within the SZ immediately prior to and during ramp-up procedures.

Comment 38: The Service has proposed that operators notify the Service or the Alaska Sea Life Center within 48 hours of an injured, dead, or distressed sea otter being observed, irrespective of whether an injury or death was associated with the specified activities (§§ 18.136(b) and 18.139(f) of the proposed rule). Any injury or death of a sea otter associated with the specified activities should be reported immediately to the Service or the Alaska Sea Life Center. And, in the past, the Service has specified that notification of injured or dead otters not associated with project activities occur within 24 hours to allow for a more timely response by trained personnel as warranted. As such, the Commission recommends that the Service require the operators to notify the Service or the Alaska Sea Life Center as follows: (1) Immediately if a sea otter is injured or killed during any of the project activities; and (2) within 24 hours of observing an injured, dead, or distressed sea otter that the observer determined is not associated with project activities.

Response 38: The applicant has committed to notifying the Alaska Sea Life Center and the Service as recommended.

Comment 39: The Service should employ time or area restrictions to mitigate acoustic impacts rather than relying on lookouts aboard vessels because many disruptions to marine mammal behavior will be difficult to detect or avoid through lookouts.

Response 39: We disagree. There is no information currently available about daily or seasonal movement patterns of otters in Cook Inlet on which to base effective timing restrictions. Ship-based PSOs are limited in their ability to monitor sea otter behaviors, but this remains the most effective way to ensure the project activities will have the least practicable adverse impact on sea otters in Cook Inlet.

Comment 40: The Service cannot, as it has here, rely on a plan to make a plan to mitigate the impacts of the specified activities on sea otters. It also may not

rubberstamp the mitigation measures proposed by the applicant, but it must consider the practicality of other measures.

Response 40: The mitigation measures that have been developed for the project are developed based on the industry standards for seismic surveys, geotechnical work, pile driving, and other oil and gas work. The mitigation measures presented in the section on Mitigation and Monitoring and in this rule under § 18.137 Mitigation include the mitigation measures required by regulation and the full suite of marine mammal monitoring and mitigation measures for activities proposed by Hilcorp and Harvest, and are incorporated here by reference (Fairweather Science LLC 2018). The AGDC will be expected to implement similar measures and meet similar standards for monitoring. Although site-specific 4MP will be required for an applicant to obtain an LOA under this rule, the expectations for the content of these plans are well established and constitute substantially more than “a plan to make a plan.”

Additionally we have added language to the section on Mitigation and Monitoring, and have summarized our assessment under Findings, *Least Practicable Adverse Impacts*. That language describes alternative mitigation measures that were considered and demonstrates why we determined that the selected mitigation will achieve the least practicable adverse impact of the proposed actions on sea otters. We have worked with Hilcorp, Harvest, and AGDC to incorporate these measures into their project plans as much as possible to ensure that these measures are practicable and will be implemented as intended. The mitigation measures required by this rule are therefore reflected in the application documents.

Comment 41: The Service should consider requiring alternative technologies to seismic surveys.

Response 41: We considered whether alternative technologies should be required. We added language to the section on Mitigation and Monitoring describing our evaluation.

Comment 42: The Service should require lowest practicable source levels for seismic surveys and in-situ sound source verification for accurate EZs.

Response 42: Hilcorp and Harvest have determined that the minimum source level necessary to provide the target data will be between 1,760 in³ and 2,400 in³. The anticipated seismic source is a 14-airgun array with a total volume of 1,945 in³. We evaluated the possible effects on sea otters of the use

of a 2,400 ci³ array. We have included a requirement to use equipment that generates the lowest practicable source levels during seismic surveys. Onsite SSV testing will be conducted prior to 2D and (3D) seismic surveys. Mitigation measures (D) and (E) have been added to paragraph (b)(1)(ii) of § 18.137 Mitigation.

Comment 43: The Service should prescribe compensatory mitigation, such as habitat restoration, for the adverse impacts of the permitted activity on marine mammals and their habitat that cannot be prevented or mitigated by modifying the activity.

Response 43: Compensatory mitigation is not required under the MMPA. Mitigation measures must be specified that achieve the least practicable adverse impact of the action on sea otters in Cook Inlet. No effective or practicable compensatory mitigation efforts have been identified for sea otters in this area. We added this information to the discussion of mitigation measures considered but not required under the section on Mitigation and Monitoring.

Comment 44: Because sea otters may be sensitive to seismic surveys at the 160 dB threshold, or Level B take; the EZ should be extended and comprehensively monitored.

Response 44: The EZ is the area where work that generates noise above Level A thresholds in the frequency range audible to sea otters must shut down or power down when sea otters are present. The EZ is comprehensively monitored. Work may not begin when 100 percent of the EZ is not visible or until after a 30-minute observation period has confirmed no otters are present in the EZ. Shutting down or powering down sound sources in response to the presence of sea otters in the 160-dB zone (the SZ) would reduce take. However, the applicant has determined that shutting down or powering down sound sources in response to any sea otter in the 160-dB SZ would not be practicable for conducting the planned activities.

Comment 45: Projects should be shut down during periods of limited visibility.

Response 45: The applicant has indicated that it is not practicable to shut down during periods of low visibility and still complete the work. We recognize that this will limit the effectiveness of visual monitoring by PSOs and have accounted for this in our estimation of take.

Comment 46: Bubble curtains or other noise-reduction technologies should be explored for use in the proposed project, as well as non-pile-driven foundation

types (e.g., gravity-based, or suction caissons).

Response 46: The Service has determined that sound-attenuation devices and alternatives to pile-supported construction may be effective means for achieving the least practicable adverse impact of the specified activities. We have added evaluation of these tools on a project-by-project basis to the required mitigation measures of this rule. Each LOA will specify whether these tools will be required and what type will be used.

Comment 47: Vessel speed should be limited to 10 knots or less.

Response 47: Lowering vessel speed can reduce the risk of serious injury and mortality of marine mammals caused by ship strikes and can reduce ocean noise that can mask marine mammal communications. Requirements for vessels to reduce speed in the vicinity of sea otters or when visibility is limited are included in § 18.137, paragraphs (d)(3) and (d)(5).

National Environmental Policy Act (NEPA)

Comment 48: The draft EA is inadequate, and the Service must prepare a full environmental impact statement, and the draft EA fails to meet the requirements of NEPA.

Response 48: Section 1501.4(b) of NEPA, found at 40 CFR Chapter V, notes that, in determining whether to prepare an environmental impact statement (EIS), a Federal agency may prepare an EA and, based on the EA document, make a determination whether to prepare an EIS. The Department of the Interior's policy and procedures for compliance with NEPA (69 FR 10866, March 8, 2004) further affirms that the purpose of an EA is to allow the responsible official to determine whether to prepare an EIS or a FONSI. The Service analyzed the proposed activity, i.e., issuance of implementing regulations, in accordance with the criteria of NEPA, and made a determination that it does not constitute a major Federal action significantly affecting the quality of the human environment. It should be noted that the Service does not authorize the actual oil and gas industry activities, as those activities are authorized by other State and Federal agencies. The Service merely authorizes the incidental take of sea otters resulting from those activities. We note that this ITR provides the Service with a means of interacting with the applicant through the mitigation, monitoring, and reporting requirements for individual projects to ensure that the impacts to sea otters are minimized. The ITR will authorize the nonlethal,

incidental take of only small numbers of sea otters, will have only a negligible impact on the species or stocks, and will not cause an unmitigable adverse impact on the availability of the species for subsistence use. As a result, we determined the regulations will not significantly affect the quality of the human environment and, therefore, a FONSI is appropriate. Accordingly, an EIS is not required under NEPA.

Comment 49: The EA is overly narrow in scope, fails to evaluate alternatives, and does not adequately evaluate the potential impacts of the action on the physical and biological environment.

Response 49: The Service believes the commenters misunderstand the requirements set forth in NEPA and the MMPA. The proposed action set forth in the EA is not activities proposed by Hilcorp, Harvest, and AGDC, but the issuance of incidental take authorization of sea otters. The Service believes we are in full compliance with both NEPA and the MMPA. We refer to our response to Comment 48 for an explanation of NEPA requirements and we refer to the Background section of the preamble of this rule for an explanation of MMPA requirements.

In addition to the proposed action, we analyzed the “no action” alternative. The Service believes the no action alternative is valid and is in compliance with relevant court rulings (see, for example, *Center for Biological Diversity v. Kempthorne*, 588 F.3d 701, 9th Cir. 2009). The action being considered is the issuance of the ITR. Therefore, the “no action” alternative would be not to issue an ITR. However, Section 101(a)(5)(A) of the MMPA specifies that the Secretary of the Interior (Secretary), through the Director of the Service, shall [emphasis added] allow the incidental, but not intentional, taking of small numbers of marine mammals in response to requests by U.S. citizens engaged in a specified activity (other than commercial fishing) in a specified geographic region if the Secretary finds that the total of such taking will have a negligible impact on the species or stock and will not have an unmitigable adverse impact on the availability of the species or stock for subsistence uses. Therefore, if a citizen petitions the Service to promulgate regulations, we are required to initiate the process and make the appropriate findings. If there is no request for an ITR, there would be no need for any analysis, including alternatives.

Comment 50: The Service’s cumulative impacts analysis is deficient. The indirect and cumulative impacts of greenhouse gas pollution from operations and downstream

consumption of fossil fuels must be analyzed, and effects of ocean warming and acidification must be considered.

Response 50: The Service has considered the effects of climate change in our assessment of cumulative impacts. We considered the best available information regarding potential impacts of climate change and analyzed all relevant direct, indirect, and cumulative effects on sea otters, and their habitat, potentially caused by the specified activities in the Cook Inlet region during the 5-year period of this ITR. The level of analysis the commenters suggest is beyond the scope appropriate for this ITR. We do consider broader questions about climate change and how it may cause additive stress on sea otter populations over the long term generally in the EA. The Service finds that, while greenhouse gas emissions are clearly contributing to climate change, the comprehensive authority to regulate those emissions is not found in the statutes that govern the management of marine mammals. The challenge posed by climate change and its ultimate solution is much broader than the scope and scale of this ITR and EA.

ESA

Comment 51: The Service must comply with the Endangered Species Act.

Response 51: As required by section 7 of the ESA the Service has completed an intra-Service consultation under the ESA for the listed stock of sea otters and their critical habitat prior to promulgating this ITR.

Oil Spill Risks and Effects

Comment 52: The project activities present an unacceptable risk of oil spills especially considering Hilcorp’s aging infrastructure and poor record of safety and environmental compliance.

Response 52: We acknowledge that an oil spill is a possible outcome of the specified activities in Cook Inlet, and for this reason we have discussed potential spills and their impacts to sea otters (see Potential Impacts from an Oil Spill or Unpermitted Discharge). It is beyond the authority of the Service and the MMPA to regulate potential accidental discharge into the environment. Waste product discharge into the environment is regulated under other laws and permits, such as provisions of the Clean Water Act (33 U.S.C. 1251 *et seq.*) and the Oil Pollution Act (33 U.S.C. 2701 *et seq.*), among others. However, we have considered the likelihood of spills resulting from the activities in Cook Inlet, and have determined that there is a low probability of a major spill. Small spills are more likely, but we have

determined that, should they occur, they will likely affect only a small number of sea otters, will have a negligible impact on these stocks, and will not have an unmitigable adverse impact on their availability for subsistence uses.

Required Determinations

National Environmental Policy Act (NEPA)

We have prepared an EA in accordance with the NEPA of 1969 (42 U.S.C. 4321 *et seq.*) and have concluded that issuance of an ITR for the nonlethal, incidental, unintentional take by harassment of small numbers of sea otters in Alaska during activities conducted by Hilcorp, Harvest, and AGDC in 2019 to 2024 is not a major Federal action significantly affecting the quality of the human environment within the meaning of section 102(2)(C) of the NEPA. A copy of the EA and the Service’s FONSI can be obtained from the locations described in **ADDRESSES**.

Endangered Species Act (ESA)

Under the ESA, all Federal agencies are required to ensure the actions they authorize are not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of critical habitat. The southwest DPS of sea otters is listed as threatened under the ESA at 50 CFR 17.11(h) (70 FR 46366, August 9, 2005). The planned activities will occur within designated critical habitat found at 50 CFR 17.95(a). Prior to issuance of this final ITR, we completed an intra-Service consultation under section 7 of the ESA on our proposed issuance of an ITR. The evaluations and findings that resulted from this consultation are available on the Service’s website and at <https://www.regulations.gov>.

Regulatory Planning and Review

Executive Order 12866 provides that the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget (OMB) will review all significant rules for a determination of significance. OMB has designated this rule as not significant.

Executive Order 13563 reaffirms the principles of Executive Order 12866 while calling for improvements in the nation’s regulatory system to promote predictability, to reduce uncertainty, and to use the best, most innovative, and least burdensome tools for achieving regulatory ends. The executive order directs agencies to consider regulatory approaches that reduce burdens and maintain flexibility

and freedom of choice for the public where these approaches are relevant, feasible, and consistent with regulatory objectives. Executive Order 13563 emphasizes further that regulations must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this rule in a manner consistent with these requirements.

OIRA bases its determination of significance upon the following four criteria: (a) Whether the rule will have an annual effect of \$100 million or more on the economy or adversely affect an economic sector, productivity, jobs, the environment, or other units of the government; (b) Whether the rule will create inconsistencies with other Federal agencies' actions; (c) Whether the rule will materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients; (d) Whether the rule raises novel legal or policy issues.

Expenses will be related to, but not necessarily limited to: The development of applications for LOAs; monitoring, recordkeeping, and reporting activities conducted during oil and gas operations; development of activity- and species-specific marine mammal monitoring and mitigation plans; and coordination with Alaska Natives to minimize effects of operations on subsistence hunting. Realistically, costs of compliance with this rule are minimal in comparison to those related to actual oil and gas exploration, development, production, and transport operations. The actual costs to develop the petition for promulgation of regulations and LOA requests probably do not exceed \$200,000 per year, short of the "major rule" threshold that would require preparation of a regulatory impact analysis. As is presently the case, profits will accrue to the applicant; royalties and taxes will accrue to the Government; and the rule will have little or no impact on decisions by the applicant to relinquish tracts and write off bonus payments.

Small Business Regulatory Enforcement Fairness Act

We have determined that this rule is not a major rule under 5 U.S.C. 804(2), the Small Business Regulatory Enforcement Fairness Act. The rule is also not likely to result in a major increase in costs or prices for consumers, individual industries, or government agencies or have significant adverse effects on competition, employment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-

based enterprises in domestic or export markets.

Regulatory Flexibility Act

We have determined that this rule will not have a significant economic effect on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*). Hilcorp, Harvest, AGDC, and their contractors conducting exploration, development, production, and transportation of oil and gas in Cook Inlet, Alaska, are the only entities subject to this ITR. Therefore, neither a Regulatory Flexibility Analysis nor a Small Entity Compliance Guide is required.

Takings Implications

This rule does not have takings implications under Executive Order 12630 because it authorizes the nonlethal, incidental, but not intentional, take of sea otters by oil and gas industry companies and, thereby, exempts these companies from civil and criminal liability as long as they operate in compliance with the terms of their LOAs. Therefore, a takings implications assessment is not required.

Federalism Effects

This rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism Assessment under Executive Order 13132. The MMPA gives the Service the authority and responsibility to protect sea otters.

Unfunded Mandates Reform Act

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 *et seq.*), this rule will not "significantly or uniquely" affect small governments. A Small Government Agency Plan is not required. The Service has determined and certifies pursuant to the Unfunded Mandates Reform Act that this rulemaking will not impose a cost of \$100 million or more in any given year on local or State governments or private entities. This rule will not produce a Federal mandate of \$100 million or greater in any year, *i.e.*, it is not a "significant regulatory action" under the Unfunded Mandates Reform Act.

Government-to-Government Relationship With Native American Tribal Governments

It is our responsibility to communicate and work directly on a Government-to-Government basis with federally recognized Alaska Native tribes and corporations in developing programs for healthy ecosystems. We seek their full and meaningful participation in evaluating and

addressing conservation concerns for protected species. It is our goal to remain sensitive to Alaska Native culture, and to make information available to Alaska Natives. Our efforts are guided by the following policies and directives: (1) The Native American Policy of the Service (January 20, 2016); (2) the Alaska Native Relations Policy (currently in draft form); (3) Executive Order 13175 (January 9, 2000); (4) Department of the Interior Secretarial Orders 3206 (June 5, 1997), 3225 (January 19, 2001), 3317 (December 1, 2011), and 3342 (October 21, 2016); (5) the Alaska Government-to-Government Policy (a departmental memorandum issued January 18, 2001); and (6) the Department of the Interior's policies on consultation with Alaska Native tribes and organizations.

We have evaluated possible effects of the specified activities on federally recognized Alaska Native Tribes and corporations. Through the ITR process identified in the MMPA, the applicant has presented a communication process, culminating in a POC if needed, with the Native organizations and communities most likely to be affected by their work. The applicant has engaged these groups in informational communications. We invited continued discussion about the proposed ITR.

We received a request for Government-to-Government consultation on this ITR from the Chickaloon Village Traditional Council (CVTC). When the CVTC and the Service were not able to schedule a time and place suitable to both parties to conduct the consultation, the CVTC chose to provide written comments to the Service expressing their views on the ITR. We have responded to their comments under Summary of and Response to Comments and Recommendations and will continue to engage with CVTC to determine whether further consultation is desired.

Civil Justice Reform

The Departmental Solicitor's Office has determined that this regulation does not unduly burden the judicial system and meets the applicable standards provided in sections 3(a) and 3(b)(2) of Executive Order 12988.

Paperwork Reduction Act

This rule includes a revision to an existing information collection. All information collections require approval under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). We may not conduct or sponsor, and you are not required to respond to, a collection of information unless it displays a currently valid OMB control number.

The OMB previously reviewed and approved the information collection requirements associated with incidental take of marine mammals in the Beaufort and Chukchi Seas and assigned OMB Control Number 1018–0070 (expires July 31, 2020).

The revised requirements reporting and/or recordkeeping requirements identified below were approved by OMB:

(1) Remove references to 50 CFR 18 subpart I (expired); and

(2) Add references to 50 CFR 18 subpart K.

Title of Collection: Incidental Take of Marine Mammals During Specified Activities, 50 CFR 18.27 and 50 CFR 18, Subparts J and K.

OMB Control Number: 1018–0070.

Form Numbers: None.

Type of Review: Revision of a currently approved collection.

Respondents/Affected Public: Oil and gas industry representatives, including applicants for ITRs and LOAs, operations managers, and environmental compliance personnel.

Total Estimated Number of Annual Respondents: 84.

Total Estimated Number of Annual Responses: 356.

Estimated Completion Time per Response: Varies from 1.5 hours to 150 hours, depending on activity.

Total Estimated Number of Annual Burden Hours: 1,800.

Respondent's Obligation: Required to obtain or retain a benefit.

Frequency of Collection: On occasion.

Total Estimated Annual Non-hour Burden Cost: \$200,000.

You may send comments on any aspect of this information collection to the Service Information Collection Clearance Officer, U.S. Fish and Wildlife Service, 5275 Leesburg Pike, MS: JAO/1N, Falls Church, VA 22041–3803 (mail); or Info_Coll@fws.gov (email). Please reference OMB Control Number 1018–BD63/0070 in the subject line of your comments

Energy Effects

Executive Order 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. This rule provides exceptions from the taking prohibitions of the

MMPA for entities engaged in the exploration of oil and gas in Cook Inlet, Alaska. By providing certainty regarding compliance with the MMPA, this rule will have a positive effect on the oil and gas industry and its activities. Although the rule requires an applicant to take a number of actions, these actions have been undertaken as part of oil and gas industry operations for many years as part of similar past regulations in Alaska. Therefore, this rule is not expected to significantly affect energy supplies, distribution, or use and does not constitute a significant energy action. No Statement of Energy Effects is required.

References

For a list of the references cited in this rule, see Docket No. FWS–R7–ES–2019–0012, available at <https://www.regulations.gov>.

List of Subjects in 50 CFR Part 18

Administrative practice and procedure, Alaska, Imports, Indians, Marine mammals, Oil and gas exploration, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

For the reasons set forth in the preamble, the Service amends part 18, subchapter B of chapter 1, title 50 of the Code of Federal Regulations as set forth below.

PART 18—MARINE MAMMALS

■ 1. The authority citation of 50 CFR part 18 continues to read as follows:

Authority: 16 U.S.C. 1361 *et seq.*

■ 2. Add subpart K to read as follows:

Subpart K—Nonlethal Taking of Marine Mammals Incidental to Oil and Gas Activities in Cook Inlet, Alaska

Sec.

18.130 Specified activities covered by this subpart.

18.131 Specified geographic region where this subpart applies.

18.132 Dates this subpart is in effect.

18.133 Authorized take allowed under a Letter of Authorization (LOA).

18.134 Procedure to obtain a Letter of Authorization (LOA).

18.135 How the Service will evaluate a request for a Letter of Authorization (LOA).

18.136 Prohibited take under a Letter of Authorization (LOA).

18.137 Mitigation.

18.138 Monitoring.

18.139 Reporting requirements.

18.140 Measures to reduce impacts to subsistence users.

18.141 Information collection requirements.

Subpart K—Nonlethal Taking of Marine Mammals Incidental to Oil and Gas Activities in Cook Inlet, Alaska

§ 18.130 Specified activities covered by this subpart.

Regulations in this subpart apply to the nonlethal incidental, but not intentional, take, as defined in 50 CFR 18.3 and under the Marine Mammal Protection Act (16 U.S.C. 1362), of small numbers of northern sea otters (*Enhydra lutris kenyoni*; hereafter “otter,” “otters,” or “sea otters”) by Hilcorp Alaska, LLC, Harvest Alaska, LLC, and the Alaska Gasline Development Corporation while engaged in activities associated with or in support of oil and gas exploration, development, production, and transportation in Cook Inlet, Alaska.

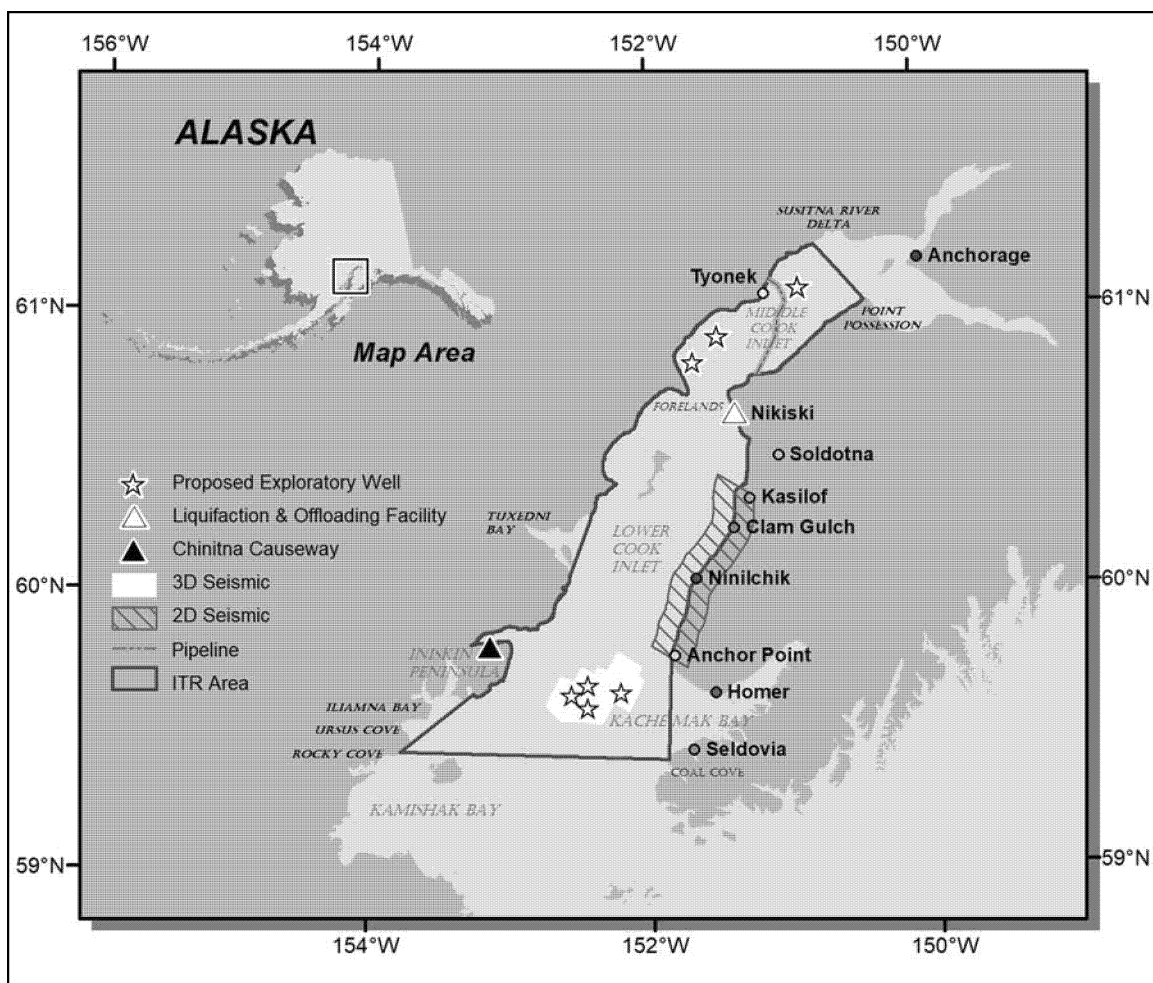
§ 18.131 Specified geographic region where this subpart applies.

(a) The specified geographic region is Cook Inlet, Alaska, south of a line from the Susitna River Delta to Point Possession (approximately 61°15'54" N, 150°41'07" W, to 61°02'19" N, 150°23'48" W, WGS 1984) and north of a line from Rocky Cove to Coal Cove (approximately 59°25'56" N, 153°44'25" W and 59°23'48" N, 151°54'28" W, WGS 1984), excluding Ursus Cove, Iniskin Bay, Iliamna Bay, and Tuxedni Bay.

(b) The geographic area of this incidental take regulation (ITR) includes all Alaska State waters and Outer Continental Shelf Federal waters within this area as well as all adjacent rivers, estuaries, and coastal lands where sea otters may occur, except for those areas explicitly excluded in paragraph (a) of this section.

(c) Map of the Cook Inlet ITR region follows:

BILLING CODE 4333–15–P



BILLING CODE 4333-15-C

§ 18.132 Dates this subpart is in effect.

Regulations in this subpart are effective from August 1, 2019, to August 1, 2024.

§ 18.133 Authorized take allowed under a Letter of Authorization (LOA).

(a) To incidentally take marine mammals pursuant to the regulations in this subpart, Hilcorp Alaska, LLC, Harvest Alaska, LLC, or the Alaska Gasline Development Corporation (hereafter “the applicant”) must apply for and obtain an LOA in accordance with §§ 18.27(f) and 18.134. The applicant is a U.S. citizen as defined in § 18.27(c).

(b) An LOA allows for the nonlethal, incidental, but not intentional take by harassment of sea otters during activities specified in § 18.130 within the Cook Inlet ITR region described in § 18.131.

(c) Each LOA will set forth:

(1) Permissible methods of incidental take;

(2) Means of effecting the least practicable adverse impact (*i.e.*, mitigation) on the species, its habitat,

and the availability of the species for subsistence uses; and

(3) Requirements for monitoring and reporting.

(d) Issuance of the LOA(s) must be based on a determination that the level of take will be consistent with the findings made for the total allowable take under these regulations in this subpart.

§ 18.134 Procedure to obtain a Letter of Authorization (LOA).

(a) The applicant must submit the request for authorization to the U.S. Fish and Wildlife Service (Service) Alaska Region Marine Mammals Management Office (MMM), MS 341, 1011 East Tudor Road, Anchorage, Alaska, 99503, at least 90 days prior to the start of the proposed activity.

(b) The request for an LOA must comply with the requirements set forth in §§ 18.137 through 18.139 and must include the following information:

(1) A plan of operations that describes in detail the proposed activity (type of project, methods, and types and numbers of equipment and personnel, etc.), the dates and duration of the

activity, and the specific locations of and areas affected by the activity. Changes to the proposed project without prior authorization may invalidate an LOA.

(2) A site-specific marine mammal monitoring and mitigation plan to monitor and mitigate the effects of the activity on sea otters.

(3) An assessment of potential effects of the proposed activity on subsistence hunting of sea otters.

(i) The applicant must communicate with potentially affected subsistence communities along the Cook Inlet coast and appropriate subsistence user organizations to discuss the location, timing, and methods of proposed activities and identify any potential conflicts with subsistence hunting activities.

(ii) The applicant must specifically inquire of relevant communities and organizations if the proposed activity will interfere with the availability of sea otters for the subsistence use of those groups.

(iii) The applicant must include documentation of consultations with potentially affected user groups.

Documentation must include a list of persons contacted, a summary of input received, any concerns identified by community members and hunter organizations, and the applicant's responses to identified concerns.

(iv) If any concerns regarding effects of the activity on sea otter subsistence harvest are identified, the applicant will provide to the Service a Plan of Cooperation (POC) with specific steps for addressing those concerns, including a schedule for ongoing community engagement and suggested measures that will be implemented to mitigate any potential conflicts with subsistence hunting.

§ 18.135 How the Service will evaluate a request for a Letter of Authorization (LOA).

(a) The Service will evaluate each request for an LOA to determine if the proposed activity is consistent with the analysis and findings made for these regulations. Depending on the results of the evaluation, we may grant the authorization, add further conditions, or deny the authorization.

(b) Once issued, the Service may withdraw or suspend an LOA if the project activity is modified in a way that undermines the results of the previous evaluation, if the conditions of the regulations in this subpart are not being substantially complied with, or if the taking allowed is or may be having more than a negligible impact on the affected stock of sea otters or an unmitigable adverse impact on the availability of sea otters for subsistence uses.

(c) The Service will make decisions concerning withdrawals of an LOA, either on an individual or class basis, only after notice and opportunity for public comment in accordance with § 18.27(f)(5). The requirement for notice and public comment will not apply should we determine that an emergency exists that poses a significant risk to the well-being of the species or stocks of sea otters.

§ 18.136 Prohibited take under a Letter of Authorization (LOA).

(a) Except as otherwise provided in this subpart, prohibited taking is described in § 18.11 as well as: Intentional take, lethal incidental take of sea otters, and any take that fails to comply with this subpart or with the terms and conditions of an LOA.

(b) If project activities cause unauthorized take, the applicant must take the following actions:

(1) Cease activities immediately (or reduce activities to the minimum level necessary to maintain safety) and report the details of the incident to the Service MMM within 48 hours; and

(2) Suspend further activities until the Service has reviewed the circumstances, determined whether additional mitigation measures are necessary to avoid further unauthorized taking, and notified the applicant that it may resume project activities.

§ 18.137 Mitigation.

(a) *Mitigation measures for all LOAs.* The applicant, including all personnel operating under the applicant's authority (or "operators," including contractors, subcontractors, and representatives) must undertake the following activities to avoid and minimize take of sea otters by harassment.

(1) Implement policies and procedures to avoid interactions with and minimize to the greatest extent practicable adverse impacts on sea otters, their habitat, and the availability of these marine mammals for subsistence uses.

(2) Develop avoidance and minimization policies and procedures, in cooperation with the Service, that include temporal or spatial activity restrictions to be used in response to the presence of sea otters engaged in a biologically significant activity (e.g., resting, feeding, hauling out, mating, or nursing).

(3) Cooperate with the Service's MMM Office and other designated Federal, State, and local agencies to monitor and mitigate the impacts of oil and gas industry activities on sea otters.

(4) Allow Service personnel or the Service's designated representative to board project vessels or visit project work sites for the purpose of monitoring impacts to sea otters and subsistence uses of sea otters at any time throughout project activities so long as it is safe to do so.

(5) Designate trained and qualified protected species observers (PSOs) to monitor for the presence of sea otters, initiate mitigation measures, and monitor, record, and report the effects of the activities on sea otters. The applicant is responsible for providing training to PSOs to carry out mitigation and monitoring.

(6) Have an approved mitigation and monitoring plan on file with the Service MMM and onsite that includes the following information:

(i) The type of activity and where and when the activity will occur (i.e., a summary of the plan of operation);

(ii) Personnel training policies, procedures, and materials;

(iii) Site-specific sea otter interaction risk evaluation and mitigation measures;

(iv) Sea otter avoidance and encounter procedures; and

(v) Sea otter observation and reporting procedures.

(7) Contact affected subsistence communities and hunter organizations to identify any potential conflicts that may be caused by the proposed activities and provide the Service documentation of communications as described in § 18.134.

(b) *Mitigation measures for in-water noise-generating work.* The applicant must carry out the following measures:

(1) *Mitigation zones.* Establish mitigation zones for project activities that generate underwater sound levels ≥ 160 decibels (dB) between 125 hertz (Hz) and 38 kilohertz (kHz) (hereafter "noise-generating work").

(i) All dB levels are referenced to 1 μ Pa for underwater sound. All dB levels herein are dB_{RMS} unless otherwise noted; dB_{RMS} refers to the root-mean-squared dB level, the square root of the average of the squared sound pressure level, typically measured over 1 second.

(ii) Mitigation zones must include all in-water areas where work-related sound received by sea otters will match the levels and frequencies in paragraph (b)(1) of this section. Mitigation zones will be designated as follows:

(A) An Exclusion Zone (EZ) will be established throughout all areas where sea otters may be exposed to sound levels capable of causing Level A take as shown in the table in paragraph (b)(1)(iii) of this section.

(B) The Safety Zone (SZ) is an area larger than the EZ and will include all areas within which sea otters may be exposed to noise levels that will likely result in Level B take as shown in the table in paragraph (b)(1)(iii) of this section.

(C) Both the EZ and SZ will be centered on the sound source. The method of estimation and minimum radius of each zone will be specified in any LOA issued under § 18.135 and will be based on onsite sound source verification (SSV), if available, or the best available science.

(D) Onsite SSV testing will be conducted prior to two-dimensional (2D) and three-dimensional (3D) seismic surveys.

(E) Seismic surveys (2D and 3D) must be conducted using equipment that generates the lowest practicable levels of underwater sound within the range of frequencies audible to sea otters.

(iii) Summary of acoustic exposure thresholds for take of sea otters from underwater sound in the frequency range 125 Hz–38 kHz:

TABLE 1 TO § 18.137(b)(1)(iii)

Marine mammals	Injury (Level A) threshold ¹		Disturbance (Level B) threshold
	Impulsive	Non-impulsive	All
Sea otters	232 dB peak; 203 dB SEL _{CUM}	219 dB SEL _{CUM}	160 dB _{RMS} .

¹ Based on acoustic criteria for otariid pinnipeds from the National Marine Fisheries Service. Sound source types are separated into impulsive (e.g., seismic, pipe driving, sub-bottom profiler) and non-impulsive (drilling, water jet) and require estimation of the distance to the peak received sound pressure level (peak) and 24-hr cumulative sound exposure level (SEL_{CUM}).

(2) *Monitoring.* Designate trained and qualified PSOs or “observers” to monitor for the presence of sea otters in mitigation zones, initiate mitigation measures, and record and report the effects of project work on otters for all noise-generating work.

(3) *Mitigation measures for sea otters in mitigation zones.* The following actions will be taken in response to otters in mitigation zones:

(i) Sea otters that are under no visible distress within the SZ must be monitored continuously. Power down, shut down, or maneuver away from the sea otter if practicable to reduce sound received by the animal. Maintain 100-m (301-ft) separation distance whenever possible. Exposures in this zone are counted as one Level B take per animal per day.

(ii) When sea otters are observed within or approaching the EZ, noise-generating work as defined in paragraph (b)(1) of this section must be immediately shut down or powered down to reduce the size of the zone sufficiently to exclude the animal from the zone. Vessel speed or course may be altered to achieve the same task. Exposures in this zone are counted as one Level A take per animal per day.

(iii) When sea otters are observed in visible distress (for example, vocalizing, repeatedly spy-hopping, or fleeing), noise-generating work as defined in paragraph (b)(1) of this section must be immediately shut down or powered down to reduce the size of the zone sufficiently to exclude the animal from the zone.

(iv) Following a shutdown, the noise-generating activity will not resume until the sea otter has cleared the EZ. The animal will be considered to have cleared the EZ if it is visually observed to have left the EZ or has not been seen within the EZ for 30 minutes or longer.

(4) *Ramp-up procedures.* Prior to noise-generating work, a “ramp-up” procedure must be used to increase the levels of underwater sound from noise-generating work at a gradual rate.

(i) *Seismic surveys:* A ramp-up will be used at the initial start of airgun operations and prior to restarting after any period greater than 10 minutes

without airgun operations, including a power-down or shutdown event (described in paragraphs (b)(6) and (7) of this section). During geophysical work, the number and total volume of airguns will be increased incrementally until the full volume is achieved. The rate of ramp-up will be no more than 6 dB per 5-minute period. Ramp-up will begin with the smallest gun in the array that is being used for all airgun array configurations. During the ramp-up, the applicable mitigation zones (based on type of airgun and sound levels produced) must be maintained. It will not be permissible to ramp up the full array from a complete shutdown in thick fog or at other times when the outer part of the EZ is not visible. Ramp-up of the airguns will not be initiated if a sea otter is sighted within the EZ at any time.

(ii) *Pile/pipe driving:* A ramp-up of the hammering will precede each day’s pipe/pile driving activities or if pipe/pile driving has ceased for more than 1 hour. The EZ will be determined clear of sea otters 30 minutes prior to a ramp-up to ensure no sea otters are within or entering the EZ. Initial hammering starts will not begin during periods of poor visibility (e.g., night, fog, wind) when the entire EZ is not visible. The ramp-up procedure for impact hammers involves initially starting with three soft strikes at 40 percent energy, followed by a 1-minute waiting period followed by two subsequent three-strike sets. For vibratory hammers, initial noise generation will be limited to 15 seconds at a reduced energy level, followed by a 1-minute waiting period. This cycle will be repeated two additional times. Monitoring will occur during all hammering sessions.

(iii) *All activities:* Any shutdown due to sea otters sighted within the EZ must be followed by a 30-minute all-clear period and then a standard full ramp-up. Any shutdown for other reasons resulting in the cessation of the sound source for a period greater than 30 minutes must also be followed by full ramp-up procedures. If otters are observed during a ramp-up effort or prior to startup, a PSO must record the

observation and monitor the animal’s position until it moves out of visual range. Noise-generating work may commence if, after a full and gradual effort to ramp up the underwater sound level, the otter is outside of the EZ and does not show signs of visible distress (for example, vocalizing, repeatedly spy-hopping, or fleeing).

(5) *Startup procedures.* (i) Visual monitoring must begin at least 30 minutes prior to, and continue throughout, ramp-up efforts.

(ii) Visual monitoring must continue during all noise-generating work occurring in daylight hours.

(6) *Power-down procedures.* A power-down procedure involves reducing the volume of underwater sound generated to prevent an otter from entering the EZ.

(i) Whenever a sea otter is detected outside the EZ and, based on its position and motion relative to the noise-generating work, appears likely to enter the EZ but has not yet done so, operators may reduce power to noise-generating equipment as an alternative to a shutdown.

(ii) Whenever a sea otter is detected in the SZ, an operator may power down when practicable to reduce Level B take.

(iii) During a power-down of seismic work, the number of airguns in use may be reduced, such that the EZ is reduced, making the sea otters unlikely to enter the EZ. A mitigation airgun (airgun of small volume such as the 10-in³ gun) will be operated continuously during a power-down of seismic work.

(iv) After a power-down, noise-generating work will not resume until the sea otter has cleared the applicable EZ. The animal will be considered to have cleared the applicable zone if it is visually observed to have left the EZ and has not been seen within the zone for 30 minutes.

(7) *Shutdown procedure.* A shutdown occurs when all noise-generating work is suspended.

(i) Noise-generating work will be shut down completely if a sea otter enters the EZ.

(ii) The shutdown procedure will be accomplished within several seconds of the determination that a sea otter is either in or about to enter the EZ or as

soon as practicable considering worker safety and equipment integrity.

(iii) Noise-generating work will not proceed until all sea otters have cleared the EZ and the PSOs on duty are confident that no sea otters remain within the EZ. An otter will be considered to have cleared the EZ if it is visually observed to have left the EZ or has not been seen within the zone for 30 minutes.

(iv) Visual monitoring must continue for 30 minutes after use of the acoustic source ceases or the sun sets, whichever is later.

(8) *Emergency shutdown.* If observations are made or credible reports are received that one or more sea otters are within the area of noise-generating work and are indicating acute distress associated with the work, such as any injury due to seismic noise or persistent vocalizations indicating separation of mother from pup, the work will be immediately shut down and the Service contacted. Work will not be restarted until review and approval by the Service.

(9) To ensure the proposed activities remain consistent with the estimated take of sea otters, operators may not conduct 3D seismic surveys where doing so will generate underwater noise levels that are likely to exceed acoustic exposure thresholds within areas of estimated sea otter densities greater than 0.026 otters per km. Maps of the areas will be provided to 3D seismic operators and may be adjusted based on SSV results. This does not apply to 2D seismic surveys.

(c) *Mitigation for all in-water construction and demolition activity.* (1) The applicant must implement a minimum EZ of a 10-m radius around the in-water construction and demolition. If a sea otter comes within or approaches the EZ, such operations must cease. A larger EZ may be required for some activities, such as blasting, and will be specified in the LOA.

(2) All work in intertidal areas shall be conducted during low tide when the site is dewatered to the maximum extent practicable.

(3) The applicant must evaluate alternatives to pile-supported facilities. If no practicable alternative exists, the applicant must then evaluate the use of sound-attenuation devices such as pile caps and cushions, bubble curtains, and dewatered cofferdams during construction. The Service may require sound-attenuation devices or alternatives to pile-supported designs.

(d) *Measures for vessel-based activities.* (1) Vessel operators must take every precaution to avoid harassment of

sea otters when a vessel is operating near these animals.

(2) Vessels must remain at least 500 m from rafts of otters unless safety is a factor.

(3) Vessels must reduce speed and maintain a distance of 100 m (328 ft) from all sea otters unless safety is a factor.

(4) Vessels must not be operated in such a way as to separate members of a group of sea otters from other members of the group.

(5) When weather conditions require, such as when visibility drops, vessels must adjust speed accordingly to avoid the likelihood of injury to sea otters.

(6) Vessels in transit and support vessels must use established navigation channels or commonly recognized vessel traffic corridors, and must avoid alongshore travel in shallow water (<20 m) whenever practicable.

(7) All vessels must avoid areas of active or anticipated subsistence hunting for sea otters as determined through community consultations.

(8) Vessel operators must be provided written guidance for avoiding collisions and minimizing disturbances to sea otters. Guidance will include measures identified in paragraphs (d)(1) through (7) of this section.

(e) *Mitigation measures for aircraft activities.* (1) Aircraft must maintain a minimum altitude of 305 m (1,000 ft) to avoid unnecessary harassment of sea otters, except during takeoff and landing, and when a lower flight altitude is necessary for safety due to weather or restricted visibility.

(2) Aircraft must not be operated in such a way as to separate members of a group of sea otters from other members of the group.

(3) All aircraft must avoid areas of active or anticipated subsistence hunting for sea otters as determined through community consultations.

(4) Unmanned aerial systems or drones must not cause take by harassment of sea otters. Measures for avoidance of take may be required in an LOA, and may include maintaining a minimum altitude and horizontal distance no less than 100 m away from otters, conducting continuous visual monitoring by PSOs, and ceasing activities in response to sea otter behaviors indicating any reaction to drones.

§ 18.138 Monitoring.

(a) Operators shall work with PSOs to apply mitigation measures, and shall recognize the authority of PSOs, up to and including stopping work, except where doing so poses a significant safety risk to personnel.

(b) Duties of PSOs include watching for and identifying sea otters, recording observation details, documenting presence in any applicable monitoring zone, identifying and documenting potential harassment, and working with operators to implement all appropriate mitigation measures.

(c) A sufficient number of PSOs will be available to meet the following criteria: 100 percent monitoring of EZs during all daytime periods of underwater noise-generating work; a maximum of 4 consecutive hours on watch per PSO; a maximum of approximately 12 hours on watch per day per PSO.

(d) All PSOs will complete a training course designed to familiarize individuals with monitoring and data collection procedures. A field crew leader with prior experience as a sea otter observer will supervise the PSO team. Initially, new or inexperienced PSOs will be paired with experienced PSOs so that the quality of marine mammal observations and data recording is kept consistent. Resumes for candidate PSOs will be made available for the Service to review.

(e) Observers will be provided with reticule binoculars (10x42), big-eye binoculars or spotting scopes (30x), inclinometers, and range finders. Field guides, instructional handbooks, maps and a contact list will also be made available.

(f) Observers will collect data using the following procedures:

(1) All data will be recorded onto a field form or database.

(2) Global positioning system data, sea state, wind force, and weather will be collected at the beginning and end of a monitoring period, every hour in between, at the change of an observer, and upon sightings of sea otters.

(3) Observation records of sea otters will include date; time; the observer's locations, heading, and speed (if moving); weather; visibility; number of animals; group size and composition (adults/juveniles); and the location of the animals (or distance and direction from the observer).

(4) Observation records will also include initial behaviors of the sea otters, descriptions of project activities and underwater sound levels being generated, the position of sea otters relative to applicable monitoring and mitigation zones, any mitigation measures applied, and any apparent reactions to the project activities before and after mitigation.

(5) For all otters in or near a mitigation zone, observers will record the distance from the vessel to the sea otter upon initial observation, the

duration of the encounter, and the distance at last observation in order to monitor cumulative sound exposures.

(6) Observers will note any instances of animals lingering close to or traveling with vessels for prolonged periods of time.

§ 18.139 Reporting requirements.

(a) Operators must notify the Service at least 48 hours prior to commencement of activities.

(b) Weekly reports will be submitted to the Service during in-water seismic activities. The reports will summarize project activities, monitoring efforts conducted by PSOs, the number of sea otters detected, the number exposed to sound levels greater than 160 dB, SSV results, and descriptions of all behavioral reactions of sea otters to project activities.

(c) Monthly reports will be submitted to the Service MMM for all months during which noise-generating work takes place. The monthly report will contain and summarize the following information: Dates, times, weather, and sea conditions (including Cook Inlet marine state and wind force) when sea otters were sighted; the number, location, distance from the sound source, and behavior of the otters; the associated project activities; and a description of the implementation and effectiveness of mitigation measures with a discussion of any specific behaviors the otters exhibited in response to mitigation.

(d) A final report will be submitted to the Service within 90 days after the expiration of each LOA. It will include the following items:

(1) Summary of monitoring efforts (hours of monitoring, activities monitored, number of PSOs, and, if requested by the Service, the daily monitoring logs).

(2) All project activities will be described, along with any additional work yet to be done. Factors influencing visibility and detectability of marine mammals (e.g., sea state, number of observers, and fog and glare) will be discussed.

(3) The report will also address factors affecting the presence and distribution of sea otters (e.g., weather, sea state, and project activities). An estimate will be included of the number of sea otters exposed to noise at received levels greater than or equal to 160 dB (based on visual observation).

(4) The report will describe changes in sea otter behavior resulting from project activities and any specific behaviors of interest.

(5) It will provide a discussion of the mitigation measures implemented during project activities and their observed effectiveness for minimizing impacts to sea otters. Sea otter observation records will be provided to the Service in the form of electronic database or spreadsheet files.

(6) The report will also evaluate the effectiveness of the POC (if applicable) for preventing impacts to subsistence users of sea otters, and it will assess any effects the operations may have had on the availability of sea otters for subsistence harvest.

(e) All reports shall be submitted by email to fw7_mmm_reports@fws.gov.

(f) Injured, dead, or distressed sea otters that are not associated with project activities (e.g., animals known to be from outside the project area, previously wounded animals, or carcasses with moderate to advanced decomposition or scavenger damage) must be reported to the Service within 24 hours of the discovery to either the Service MMM (1-800-362-5148, business hours); or the Alaska SeaLife Center in Seward (1-888-774-7325, 24 hours a day); or both. Photographs, video, location information, or any other available documentation shall be provided to the Service.

(g) Operators must notify the Service upon project completion or end of the work season.

§ 18.140 Measures to reduce impacts to subsistence users.

(a) Prior to conducting the work, the applicant will take the following steps to reduce potential effects on subsistence harvest of sea otters:

(1) Avoid work in areas of known sea otter subsistence harvest;

(2) Discuss the planned activities with subsistence stakeholders including Cook Inlet villages, traditional councils, and the Cook Inlet Regional Citizens Advisory Council;

(3) Identify and work to resolve concerns of stakeholders regarding the project's effects on subsistence hunting of sea otters; and

(b) If any unresolved or ongoing concerns remain, develop a POC in consultation with the Service and subsistence stakeholders to address these concerns. The POC must include a schedule for ongoing community engagement and specific measures for mitigating any potential conflicts with subsistence hunting.

§ 18.141 Information collection requirements.

(a) We may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid Office of Management and Budget (OMB) control number. OMB has approved the collection of information contained in this subpart and assigned OMB control number 1018-0070. The applicant must respond to this information collection request to obtain a benefit pursuant to section 101(a)(5) of the Marine Mammal Protection Act. We will use the information to:

(1) Evaluate the application and determine whether or not to issue specific LOAs; and

(2) Monitor impacts of activities and effectiveness of mitigation measures conducted under the LOAs.

(b) Comments regarding the burden estimate or any other aspect of this requirement must be submitted to the Information Collection Clearance Officer, U.S. Fish and Wildlife Service, at the address listed in 50 CFR part 2.1.

Dated: July 18, 2019.

Karen Budd-Falen,

Deputy Solicitor for Parks and Wildlife, Exercising the Authority of the Assistant Secretary for Fish and Wildlife and Parks.

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