UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF OCEAN ENERGY MANAGEMENT
GULF OF AMERICA OCS REGION
NEW ORLEANS, LOUISIANA

SITE-SPECIFIC ENVIRONMENTAL ASSESSMENT

OF
EXPLORATION PLAN
NO. N-10269

FOR

SHELL OFFSHORE, INC.

MAY 11, 2026

**RELATED ENVIRONMENTAL DOCUMENTS**

*Gulf of Mexico Catastrophic Spill Event Analysis: High-Volume, Extended-Duration Oil Spill Resulting from Loss of Well Control on the Gulf of Mexico Outer Continental Shelf; 2nd Revision* (OCS Report BOEM 2021-007)

*Biological Environmental Background Report for the Gulf of Mexico OCS Region* (OCS Report BOEM 2021-015)

*Programmatic Description of the Potential Effects from Gulf of Mexico OCS Oil- and Gas-Related Activities: A Supporting Information Document* (OCS Report BOEM 2023-053)

*Gulf of America Regional OCS Oil and Gas Lease Sales and Post-Lease Activities: Final Programmatic Environmental Impact Statement* (OCS EIS/EA BOEM 2025-042)

## FINDING OF NO SIGNIFICANT IMPACT (FONSI)

The Bureau of Ocean Energy Management (BOEM) has prepared a Site-Specific Environmental Assessment (SEA) for Exploration Plan (EP) No. N-10269 complying with the National Environmental Policy Act (NEPA) at 42 United States Code (U.S.C.) §§ 4321 et seq. The United States Department of the Interior (DOI) NEPA implementing regulations at 43 Code of Federal Regulations (CFR) Part 46, DOI NEPA Handbook § 1.5, and BOEM policy require an evaluation of proposed major Federal actions, which under BOEM jurisdiction includes approving a plan for oil and gas exploration or development activity on the Outer Continental Shelf (OCS).

Secretary of the Interior Doug Burgum issued Secretary's Order 3423, which directed the renaming of the Gulf of Mexico to the Gulf of America. As a result, BOEM updated existing content while legacy content such as previously published reports, studies, and NEPA documents remain unchanged.

Impacts caused by similar actions to that proposed were examined at a basin-wide scale in the following NEPA and relevant documents:

- *Gulf of Mexico Catastrophic Spill Event Analysis: High-Volume, Extended-Duration Oil Spill Resulting from Loss of Well Control on the Gulf of Mexico Outer Continental Shelf; 2nd Revision* (Gulf of Mexico Catastrophic Spill Event Analysis) (OCS Report BOEM 2021-007)
- *Biological Environmental Background Report for the Gulf of Mexico OCS Region* (BEBR) (OCS Report BOEM 2021-015)
- *Programmatic Description of the Potential Effects from Gulf of Mexico OCS Oil- and Gas-Related Activities: A Supporting Information Document* (Oil and Gas SID)(OCS Report BOEM 2023-053)
- *Gulf of America Regional OCS Oil and Gas Lease Sales and Post-Lease Activities: Final Programmatic Environmental Impact Statement* (2025 PEIS) (OCS EIS/EA BOEM 2025-042)

**Proposed Activities**: In the Initial EP N-10269, Shell Offshore, Inc. (Shell) proposes to explore for hydrocarbons by drilling four exploratory wells (Proposed Action). Wells A, A-Alt, B and B-Alt are located in Mississippi Canyon Block 477, Lease OCS-G 36962 in the Central Planning Area. The Proposed Action is located southeast of Venice, Louisiana, approximately 67 miles (mi) (108 kilometers [km]) from the nearest shoreline in Plaquemines Parish, Louisiana. The water depth at the proposed project location is 6,941 - 6,944 feet (ft) (2,116 - 2,117 meters [m]). Shell proposes using a mobile offshore drilling unit (MODU), either a dynamically positioned (DP) semisubmersible or a drillship, to drill these wells.

**Resources and Impacts Considered**: The impact analysis focused on the exploration activities and the resources that may be potentially impacted. The impact producing factors

(IPF) include (1) bottom disturbances, (2) waste and discharges, (3) noise, (4) vessel traffic, (5) air emissions, (6) spill and spill response, and (7) marine trash and debris.

In the Initial EP, Shell has included all required mitigation measures, Project Criteria and regulatory guidance as part of its Proposed Action. BOEM has assessed the impacts of the Proposed Action on the following resources:

- air quality
- offshore water quality
- benthic communities
- marine mammals
- sea turtles
- fish resources and essential fish habitat (EFH)
- marine and coastal birds
- archaeological resources
- human/socioecomic resources
- other marine uses.

Based on the site-specific analysis, the Proposed Action would result in negligible to minor impacts to marine mammals and sea turtles because those resources might be present at times or located near proposed activities and could potentially be impacted. Based on this site-specific analysis, BOEM's other environmental reviews under the Outer Continental Shelf Lands Act (OCSLA) and NEPA, and adherence to all required mitigation measures and regulatory guidance incorporated into the Proposed Action, no additional mitigation measures are required at this stage.

Shell's application provides information on the filing or approval status of the individual and/or site-specific Federal, State and local application approvals or permits that must be obtained prior to conducting the proposed activities. BOEM has a well-established suite of commonly applied mitigation measures (see Chapters 5 and 6 of the Oil and Gas SID) that can be applied to any of the required subsequent BOEM/BSEE permits or approvals to ensure compliance with BOEM and BSEE's regulations and other Federal laws. BOEM is also able to revise applicable mitigations as needed to adaptively manage mitigation compliance and effectiveness at each approval or permitting stage.

In the N-10269 EP, and in accordance with lease terms and applicable regulations and guidance, Shell has committed to employ required mitigation measures to address potential impacts to air quality, water quality, benthic communities, marine mammals, sea turtles, fish resources and EFH, and archaeological resources from the Proposed Action. Any remaining

impacts would be negligible. Therefore, BOEM has selected Alternative 2, the Proposed Action, and will not require additional mitigation measures as conditions of approval (COAs) at the DOCD stage. Below are the required mitigation measures:

- **Marine Debris Project Criteria:** The applicant will follow the project criteria provided under The Bureaus' Marine Debris Project Criteria.
- **Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Project Criteria:** The applicant will follow the project criteria provided under The Bureaus' Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Project Criteria.
- **In-Water Line Precaution Project Criteria:** The applicant will follow the project criteria provided under The Bureaus' In-water Line Precaution Project Criteria.
- **Moon Pool Monitoring Project Criteria:** The applicant will follow the protocols provided under The Bureaus' Moon Pool Monitoring Project Criteria.
- **Vessel Transit Within the Rice's Whale Area as Identified in the 2020 Biological Opinion's Reasonable and Prudent Alternative (2020 RWA):** The applicant will follow the project criteria provided under The Bureaus' Vessel Transit within the Rice's Whale Area as identified in the 2020 Biological Opinion's Reasonable and Prudent Alternative (2020 RWA).
- **Sea Turtle Resuscitation Guidelines Project Criteria:** The applicant will follow the project criteria provided under The Bureaus' Sea Turtle Resuscitation Guidelines Project Criteria.

**SEE Appendix B for full descriptions of the Project Criteria**

**Conclusion:** BOEM has evaluated the potential environmental impacts of the Proposed Action and, based on our evaluation in this SEA, BOEM has selected Alternative 2. The Proposed Action would have no new significant impacts on the human environment not already disclosed in the 2025 PEIS, from which the SEA tiers. Therefore, preparation of an environmental impact statement is not required. Any new information relevant to resources was updated and analyzed in the attached SEA and the other documents listed above that were reviewed and considered by BOEM.

PERRY BOUDREAUX

Digitally signed by PERRY BOUDREAUX
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May 12, 2026

Supervisor, Environmental Assessment Unit 2
Office of Environment, GOA OCS Region
Bureau of Ocean Energy Management

Date

# Certification of Environmental Assessment Compliance

This letter certifies the attached site-specific environmental assessment (SEA) for Exploration Plan (EP) No. N-10269 submitted by Shell Offshore, Inc. complies with the requirements outlined in Section 1.5 of the DOI Handbook of National Environmental Policy Act Implementing Procedures (516 DM 1).

**Page Limit Certification**

The SEA, not including citations and appendices, does not exceed the 75-page limit. This document has been prepared in accordance with the specified formatting criteria outlined in Section 1.5(e) of 516 DM 1. As the responsible official, I certify that the breadth and depth of the analysis have been tailored to meet this page limit. This SEA represents BOEM's good-faith effort to prioritize the most important considerations required by NEPA within the mandated page limits. Our prioritization reflects the bureau's expert judgment, and any considerations addressed briefly or left unaddressed were, in our judgment, not of a substantive nature that would have meaningfully informed the environmental effects or the resulting decision.

**Deadline Certification**

This SEA has been completed within the required statutory deadline described in Section 1.5(f) of 516 DM 1. The completion date of this document is within one year of April 13, 2026, which is when the final EP was deemed submitted as per 30 CFR § 550.231 (i.e., 'the date the applicant was notified their application was complete'). I certify that this document represents the bureau's good-faith effort to fulfill NEPA's requirements within the congressional timeline. In our expert opinion, the analysis is thorough and adequate to inform and reasonably explain the bureau's decision regarding the proposed action.

PERRY BOUDREAUX

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May 12, 2026

Supervisor, Environmental Assessment Unit 2
Office of Environment
Gulf of America OCS Region
Bureau of Ocean Energy Management

Date

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# Site-Specific Environmental Assessment (SEA)

# SHELL OFFSHORE, INC.

# INITIAL EXPLORATION PLAN: N-10269

## 1 INTRODUCTION

This Site-Specific Environmental Assessment (SEA) has been prepared to determine whether the proposed activities outlined in the Initial Exploration Plan (EP), N-10269, initially submitted by Shell Offshore, Inc. (Shell) on March 12, 2026, will significantly affect the quality of the human environment within the meaning of Section 102(2)(c) of the National Environmental Policy Act (NEPA) and therefore require an environmental impact statement (EIS) to be prepared. Shell's Initial EP proposes to explore for hydrocarbons by drilling 4 wells (Proposed Action). Wells A, A-Alt1, B, and B-Alt1 are located in Mississippi Canyon Block 477, Lease Number OCS-G 36962 in the Central Planning Area (CPA) of the Outer Continental Shelf (OCS).

The DOI Handbook of NEPA Implementing Procedures (516 DM 1), dated February 2026, is designed to allow for the preparation of an SEA for an individual proposed action as long as any previously unanalyzed effects are not significant. As such, this SEA is tiered to, or incorporates by reference, the following Bureau of Ocean Energy Management (BOEM) NEPA and supporting documents, which evaluated the potential impacts resulting from exploration and development activities across the OCS.

- *Biological Environmental Background Report for the Gulf of Mexico OCS Region* (BEBR) (BOEM 2021a)
- *Gulf of Mexico Catastrophic Spill Event Analysis: High-Volume, Extended-Duration Oil Spill Resulting from Loss of Well Control on the Gulf of Mexico Outer Continental Shelf; 2nd Revision* (Gulf of Mexico Catastrophic Spill Event Analysis) (BOEM 2021b)
- *Programmatic Description of the Potential Effects from Gulf of Mexico OCS Oil- and Gas-Related Activities: A Supporting Information Document* (Oil and Gas SID) (OCS Report BOEM 2023-053) (BOEM 2023)
- *Gulf of America Regional OCS Oil and Gas Lease Sales and Post-Lease Activities: Final Programmatic Environmental Impact Statement* (2025 PEIS) (OCS EIS/EA BOEM 2025-042) (BOEM 2025)

This SEA analyzes the potential impacts resulting from the proposed site-specific activities. Relevant affected environment discussions and impact analyses from the 2025 PEIS are summarized and utilized for site-specific analysis through tiering. Where applicable, additional information available in the BEBR, Oil and Gas SID, and other supporting documents above was incorporated by reference, consistent with DOI's Handbook of NEPA implementing

procedures. Relevant new information published after the above-referenced environmental analyses is included by citation. Lease stipulations, the Outer Continental Shelf Lands Act (OCSLA), all applicable Federal, State, and local regulations (as per 30 Code of Federal Regulations (CFR) § 550.101(a)); guidance provided in all applicable Notices to Lessees and Operators (NTLs) (as per 30 CFR § 550.103); and mitigation and monitoring measures identified in this SEA, the 2025 PEIS, and applicable Project Criteria have been considered in the evaluation of the Proposed Action.

Secretarial Order 3423 directed the renaming of the Gulf of Mexico to the Gulf of America. As a result, BOEM is updating new content to refer to the Gulf of America, while legacy content such as previously published reports, studies, and NEPA documents remain unchanged.

## 1.1 Background

BOEM and the Bureau of Safety and Environmental Enforcement (BSEE) have been delegated the authority under OCSLA to manage and oversee the exploration and development of OCS oil, gas, and mineral resources while ensuring safe operations and the protection of the human environment. Working together, BOEM and BSEE manage oil and gas leases, permits, authorizations, and regulate exploration, development, production, and decommissioning. Prior to authorizing activities related to these phases, BOEM conducts resource and NEPA reviews. BOEM's Office of Leasing and Plans oversees the submittal of EPs and Development Operations Coordination Documents (DOCDs) pursuant to 30 CFR part 550 subpart B.

As required by 30 CFR § 550.201, lessees and operators submit EPs and DOCDs to provide BOEM with information needed to adequately evaluate the overall potential impacts to the human environment prior to conducting activities on the lease. Submittal of an environmental impact analysis (EIA) is required in EPs under 30 CFR § 550.227 and in DOCDs under 30 CFR § 550.261, wherein the operator provides environmental information and makes impact conclusions regarding their proposed activities.

## 1.2 Purpose of and Need for the Proposed Action

Shell has submitted a plan to conduct exploration activities on the OCS. The purpose of the Proposed Action is to drill up to four wells so that Shell can utilize the information to evaluate the potential for, and develop plans for, the development and production of hydrocarbon resources on the OCS, which would contribute to the Nation's energy needs.

The need for this action is established by BOEM's responsibility under OCSLA to make OCS lands available for expeditious and orderly development, subject to environmental safeguards, in a manner that is consistent with the maintenance of competition and other national needs. Section 11 of OCSLA at 43 United States Code (U.S.C.) § 1340 requires oil and gas lessees seeking to conduct exploration activities to first obtain approval from the Secretary who has delegated the authority to grant such approval to BOEM.

In response to the Proposed Action in Shell's plan, BOEM is required by OCSLA to approve, approve with modifications, or deny the plan within 30 days (refer to 43 U.S.C. § 1340(c)(1)). The criteria that BOEM will apply in reaching a decision to approve, approve with modifications, or deny the plan within 30 days and the scope of its discretion are provided by Section 11 of OCSLA and detailed in the implementing regulations (30 CFR Part 550 Subpart B). Authorizing the Proposed Action, as outlined in the Initial EP N-10269, allows Shell to pursue its rights under the lease and to conduct exploration drilling activities.

## 1.3 Description of Proposed Action

Shell's Initial EP for drilling operations on the OCS proposes to explore for hydrocarbons by drilling four exploratory wells (Proposed Action). Wells A, A-Alt1, B, and B-Alt1 are located in Mississippi Canyon Block 477, Lease OCS-G 36962 in the Central Planning Area. The Proposed Action is located southeast of Venice, Louisiana, approximately 67 miles (mi) (108 kilometers [km]) from the nearest shoreline in Plaquemines Parish, Louisiana. The water depth at the proposed project location is 6,941 - 6,944 feet (ft) (2,116 - 2,117 meters [m]). Shell proposes using a mobile offshore drilling unit (MODU), either a dynamically positioned (DP) semisubmersible or a drillship, to drill these wells. The proposed drilling activities are expected to begin July 1, 2026 and end in 2029. They are proposing 150 drilling days per year.

Supply and crew boat facilities to support the proposed activities are to be located in existing facilities in Port Fourchon, Louisiana, approximately 132 mi (212 km) northwest of the project location. Port Fourchon will be used as the debarkation point for equipment, supplies, and crews supporting the proposed activities. Helicopter support will be flown out of Houma, Louisiana, approximately 173 mi (278 km) northwest of the project area. Gulfport and Kiln, MS will be used as back up port locations. Shell does not expect any shore-based construction or expansion in association with these proposed activities. The types of support vessels and their potential travel frequency during exploratory drilling are included in Shell's plan (Shell, 2026). No new or unusual technology is proposed by Shell.

## 1.4 Impact-Producing Factors

For purposes of this analysis, an impact-producing factor (IPF) is the outcome of a proposed activity that may pose a vulnerability risk or potential impact to the human environment, such as noise (acoustic source), air emissions, discharges and waste (effluent), or offshore habitat modification (physical disturbance). The impact analysis evaluates the potentially affected environment and the degree of the effects of the action consistent with Section 1.2 of DOI's Handbook of NEPA implementing procedures. Each phase of oil and gas operations typically have specific types of IPFs that may affect physical or environmental conditions and/or may affect one or more natural, cultural, or socioeconomic resource(s). The IPFs are categorized as routine activities, accidental events, and other effects that are reasonably foreseeable and have a close causal connection to the Proposed Action. Detailed descriptions of routine activities and accidental events considered in this SEA are provided in

**Appendix A**, and the vulnerability (effects or impacts) of resources to IPFs is also available in the BEBR and Oil and Gas SID.

### 1.4.1 Routine Activities

Routine activities are generally sequential and occur on a regular basis during the lifetime of a lease (i.e., 50 years). Examples of routine activity include geological and geophysical (G&G) surveys[1], drilling wells, installing production structures and/or subsea infrastructure (platforms, wellheads, manifolds, subsea tie-ins, pipelines), ancillary activities, and decommissioning. Specific to the activities for exploration proposed by Shell, the routine activities would result in the following:

(1) bottom disturbance or offshore habitat modification

(2) noise

(3) discharges and wastes

(4) space-use conflicts

(5) air emissions.

### 1.4.2 Accidental Events

Though not planned, intended, nor anticipated, BOEM recognizes that there is potential for accidental events. The impacts and complexity of an accidental event can vary greatly dependent upon the type, interrelated factors, type and amount of material, time of year, and resources impacted. The primary IPFs from potential accidents related to the proposed activities include the following:

(1) accidental releases (oil/chemical spills and oil spill response, emergency flaring/venting, or marine trash and debris)

(2) accidental collisions resulting in a spill (vessel to vessel or vessel to structure)

(3) accidental vessel strike (vessel to organism)

(4) accidental entanglement/entrapment (equipment or facility and organism).

## 1.5 ACCIDENTAL SPILL CONCERNS

Based on experience and the operations proposed in Shell's plan, the potential sources of spills from the proposed activity would include the following:

(1) a storage tank accident on the MODU or vessel(s)

[1] The G&G activities for oil and gas exploration and development are authorized on the basis of whether or not the proposed activities occur before leasing takes place (prelease) and are authorized by a permit or the G&G activity will occur on an existing lease (post-lease/ancillary). Postlease/ancillary activities are authorized by OCS plan approvals, plan revisions, requirement for notification, or a separate G&G permit if the survey will extend off the existing lease.

(2) a transfer operation mishap between the supply vessel(s) and the MODU

(3) a leak resulting from damage to the fuel tanks or equipment on the MODU or vessel(s)

(4) a loss of well control (LWC)[2].

As required by 30 CFR §§ 550.219 and 550.250, lessees or designated operators are required to provide BSEE and BOEM with an oil spill response plan (OSRP), prepared in accordance with 30 CFR Part 254 Subpart B, with their proposed exploration, development, or production plan for the facilities that they will use to conduct their activities or to alternatively reference their approved Regional OSRP. In addition, lessees or designated operators are required to report incidents under 30 CFR § 250.188(a) (fatalities, blowouts, explosions, etc.) and oil spills pursuant to 30 CFR § 250.187(d) and 30 CFR § 254.46 (from a rig, production facility, or pipeline estimated to be more than 1 barrel [bbl] [42 gallons (gal)]). As required in 30 CFR § 254.46(a), immediate notification is required for spills from a facility, another offshore facility, or offshore spill of unknown origin.

**Spill Response Requirements**

Agency regulations require that all lessees and designated operators of oil handling, storage, or transportation facilities located seaward of the coastline submit an OSRP before they can operate a facility. BSEE has issued NTL 2012-N06, "Guidance to Owners and Operators of Offshore Facilities Seaward of the Coast Line Concerning Regional Oil Spill Response Plans," which informs operators of OSRP requirements and requires that they have adequate resources available to protect the environment from spills or releases from their facilities. The Environmental Protection and Response Plan within the OSRP outlines the availability of spill containment and cleanup equipment and trained personnel necessary to ensure that a full response can be deployed during an oil-spill emergency.

All the proposed activities and facilities in this plan will be covered by the Regional OSRP filed by Shell (Operator Number 00689) in accordance with 30 CFR Part 550 and 30 CFR Part 254 and deemed in compliance by BSEE on November 13, 2025. Shell also certifies it has the capability to respond, to the maximum extent practicable, to a worst-case discharge, or a substantial threat of such a discharge, resulting from the activities proposed in their Initial EP (Shell, 2026).

[2] The current definition for loss of well control is as follows: uncontrolled flow of formation or other fluids (the flow may be to an exposed formation [an underground blowout] or at the surface [a surface blowout]; uncontrolled flow through a diverter; and/or uncontrolled flow resulting from a failure of surface equipment or procedures. Not all loss of well control events would result in a blowout as defined above, but they are most commonly thought of as releases to the human environment. A loss of well control can occur during any phase of development, i.e., exploratory drilling, development drilling, well completion, production, or workover operations (BOEM 2021).

**Potential Spills from Vessels/Transfer Operations**

As indicated above, offshore spills from Shell's proposed activities are possible if an accident were to damage a storage tank onboard the drilling rig, crew boat, offshore support vessel, or fuel supply vessel. Historically, accidents of this nature have resulted from unintentional vessel collisions and transfer incidents during the offloading of diesel fuel to the drilling rig. Shell plans to use either a DP semisubmersible or a drillship using a subsea blowout preventer (BOP) to conduct the proposed activities. There are several tanks onboard the MODUs that store fuel and lubricants necessary for the rig's operation. A worst-case discharge (WCD) scenario[3] from a rupture or spill from the vessels and other support are provided in **Table 1-1**.

Table 1-1. Worst-Case Discharges from Proposed Drillrigs and Vessels

| Vessel | Largest Main Tank Capacity* | Total Capacity* |
|---|---|---|
| DP Semisubmersible | 4,787 bbl | 23,433 bbl |
| DP Drillship | 14,788 bbl | 54,439 bbl |
| Crew Boat | N/A | 8,000 gal (190 bbl) |
| Supply Boat | N/A | 120,000 gal (2,857 bbl) |
| Diesel Oil Supply Vessel | N/A | 100,000 gal (2,381 bbl) |
| Helicopter | N/A | 760 gal (18 bbl) |

bbl = barrel; gal = gallon; N/A = not applicable.

**Potential Spills from a Loss of Well Control (LWC)**

BSEE requires that all LWC incidents be reported immediately per 30 CFR § 250.188(a)(3). Offshore LWCs that cause large-scale, oil-spill[4] events are rare and not expected.

[3] Information provided regarding the WCD totals and calculations is not required under NEPA regulations; however, the information is included as part of the review process and compliance with 30 CFR § 254.47; BOEM NTL 2015-N01, "Information Requirements for Exploration Plans, Development and Production Plans, and Development Operations Coordination Documents on the OCS for Worst Case Discharge and Blowout Scenarios"; and Frequency Asked Questions as part of every EP and development and production plan (DPP)/DOCD. In addition, the August 16, 2010, CEQ Report prepared following the Deepwater Horizon explosion, oil spill, and response recommended that BOEM should "Ensure that NEPA document provide decisionmakers with a robust analysis of reasonably foreseeable impacts, including an analysis of reasonably foreseeable impacts associated with low-probability catastrophic spills for oil and gas activities on the OCS" (CEQ 2010). BOEM's Gulf of Mexico Catastrophic Spill Event Analysis technical report is a robust analysis of the impacts from low-probability catastrophic spills and is included in this analysis to support decisionmaking purposes (BOEM 2021).

[4] As applicable to NEPA, Eccleston (2008) describes a catastrophic event as "large-scale damage involving destruction of species, ecosystems, infrastructure, or property with long-term effects, and/or major loss of human life." For oil and gas activities on the OCS, a catastrophic event is a high-volume, extended-duration oil spill regardless of the cause. The high-volume, extended-duration oil spill, or catastrophic spill, has been further defined by the National Oil and Hazardous Substances Pollution Contingency Plans as a "spill of national significance" or "a spill which, because of its severity, size, location, actual or potential impact on the public health

Most LWC accidents release a relatively small amount of oil into the environment before the well is brought under control by the operator or the well is sealed by natural processes known as bridging over[5]. It is important to note that spill volume is only one factor that influences the nature and severity of an event's impacts. Each oil-spill event is unique; its outcome depends on several factors. These factors include time of year and location, atmospheric and oceanographic conditions (e.g., winds, currents, coastal type, and sensitive resources), specifics of the well (i.e., flow rates, hydrocarbon characteristics, and infrastructure damage), and response efforts (i.e., speed and effectiveness). For these reasons, the severity of impacts from an oil spill cannot be predicted based on volume alone (BOEM 2021b). In the event of a LWC, an operator's first course of action is to activate the BOP to close the well. The BOP may be located on the surface of the drilling rig or subsea (on the seafloor). There are built-in redundancies in the BOP system to allow activation of selected components with the intent to seal off the well bore. If a subsea BOP cannot be operated from the drill rig, it can be operated at the seafloor using remotely operated vehicles (ROVs).

According to loss of well control data available on BSEE's website at: BSEE Offshore Incident Statistics and BSEE annual reports,[6] on average an LWC event with a surface release occurred three times or less per year from 2007 to 2023. This average is based on more than 100 exploration and development wells drilled annually. From 2015 to 2023 there were nine LWC events in water depths below 1,000 ft and 12 LWC events in water depths greater than 1,000 ft. As discussed below, the operator has an OSRP in place that addresses the WCD scenario and LWC events. Based on BSEE records from 2007 to 2023 and the safety measures in place, an LWC that results in a crude oil spill of greater than 50 bbls is unlikely to occur.

**Potential Site-Specific Spill Risk and Response**

Shell's plan describes measures for LWC prevention, likelihood for surface intervention to stop a blowout, and early intervention in the event of a blowout. Shell has developed standards for well control, personnel safety, and an emergency response plan; these methods are stated in detail in the OSRP or emergency response plan submitted by Shell. As per the information provided in Shell's OSRP and plan, the MODU that Shell plans to use will deploy a subsea BOP while drilling these wells (Shell, 2026).

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and welfare or the environment, or the necessary response effort, is so complex that it requires extraordinary coordination of Federal, State, and local, and responsible party resources to contain and cleanup the discharge" (40 CFR part 300, Appendix E) (BOEM 2021).

[5] In a LWC or blowout, the flow duration is dependent on the oil reservoir characteristics and the tendency for the well to fill in or bridge naturally (bridge over), and the timing of the intervention. The flow of a blowout well could, and often does, change as the blowout naturally bridges, the reservoir is depleted, or the reservoir pressure is reduced (Buchholz et al. 2016).

[6] The 2007 to 2016 BSEE annual reports can be found here: BSEE Annual Report. The 2014 Annual Report was based on a calendar year. The 2015 Annual Report and subsequent reports were based on U.S. fiscal year (FY), which runs from October 1 to September 30 (BSEE 2016). The last Annual Report is from FY 2016. Data from years 2015 to 2023 were acquired from: BSEE Offshore Incident Statistics.

The WCD from drilling or production operations of a subsea well is the daily rate of uncontrolled flow of natural gas or oil into the open wellbore. Operators must submit WCD calculated volumes and associated data according to NTL 2015-N01, "Information Requirements for Exploration Plans, Development and Production Plans, and Development Operations Coordination Documents on the OCS for Worst Case Discharge and Blowout Scenarios," as part of every EP and DOCD. Though not proposed or expected, Shell has estimated that a WCD scenario from a blowout of one of the wells under the proposed activities could be 256,117 barrels of oil per day (BOPD) of 38° American Petroleum Institute (API) gravity crude. In accordance with enhanced agency oversight, BOEM verified the operator's calculations used to determine the WCD volume[7].

Shell indicated in its plan that mechanical failure/collapse of the borehole in a blowout scenario is influenced by several factors including in-situ stress, rock strength and fluid velocities at the sand face. Based on the nodal analysis and reservoir simulation models outlined above, a surface blowout would create a high drawdown at the sand face. Given the substantial fluid velocities inherent in the worst-case discharge, and the scenario as defined where the formation is not supported by a cased and cemented wellbore, it is possible that the borehole may fail/collapse/bridge over within the span of a few days, significantly reducing outflow rates. However, this WCD scenario does not include any bridging or consideration of solids production with the oil and gas. Shell has developed standards for well control, personnel safety, and emergency response. These methods are stated in detail in the OSRP and plan (Shell, 2026).

In the event that a relief well is required due to a blowout, Shell indicates in its plan that there are three drilling rigs currently under contract that have the capability to drill the relief well if needed (Shell, 2026). Also there are other anchored and DP vessels that could be utilized for increased expediency or better suitability. For this project, Shell estimates that it will take an average of 8 days of transit to mobilize/demobilize to the relief well site depending on distance to travel. The relief well will take approximately 52 days to drill down to the last casing string above the blowout zone plus approximately 28 days for precision ranging activity to intersect the blowout well bore, and 2 days for kill operations. Total time to mobilize and drill a relief well would be approximately 90 days for this well. There are no existing facilities/platforms nearby from where the relief well can be drilled. Additional details related to the proposed activities can be found in Shell's Initial EP (Shell, 2026).

[7] Information provided regarding the WCD totals and calculations is not required under NEPA regulations; however, the information is included as part of the review process and compliance with 30 CFR § 254.47; NLT 2015-N01, "Information Requirements for Exploration Plans, Development and Production Plans, and Development Operations Coordination Documents on the OCS for Worst Case Discharge and Blowout Scenarios"; and Frequency Asked Questions as part of every EP and DPP/DOCD.

**Oil-Spill Risk and Assessment**

Spills with volumes greater than 10,000 bbl are uncommon. From 2001 to 2023, there have been only three spills greater than 10,000 bbl in the Gulf OCS. One was the *Deepwater Horizon* oil spill at 4.9 MMbbl (ABS Consulting Inc. 2016), which is categorized as a low-probability catastrophic spill, which is not reasonably foreseeable. In October 2017, a subsea wellhead jumper (KAA-0120) in Mississippi Canyon Block 209, about 53 miles southeast of the Louisiana coast, failed and released an estimated 16,000 barrels of oil into the Gulf. The unintended release occurred after Delta House platform operations were restarted following Hurricane Nate due to a crack in the flowline discovered through remotely operated vehicle inspection. Carried southwest by ocean currents, the spill did not reach shore (BSEE 2019). There was also a pipeline spill in November 2023 near the mouth of the Mississippi River. As of December 2023, approximately 26,000 bbl were estimated to have been released. Details regarding the cause and source are not yet available, however, the use of dispersants have not been reported and there have been no reported wildlife or shoreline impacts.

In the event of a spill, there is no single method of containing and removing the oil that would be 100 percent effective. Removal and containment efforts to respond to an ongoing spill would likely require multiple technologies, including mechanical cleanup, chemical dispersant application, and less frequently, in-situ burning of the slick. Even with the potential to deploy all of these technologies, it is likely that, with the operating limitations of current spill response technology, not all of the oil could be contained and removed from the offshore environment. It is likely that larger spills in deep waters and under the right conditions would require the simultaneous use of all available cleanup methods (i.e., mechanical cleanup, dispersant application, and in-situ burning).

The approved OSRP for the proposed project addresses a range of spill sizes and sources, including the WCD, and required response strategies. However, when considering the historical/statistical data, subsea containment improvements, BOEM and BSEE's enhanced oversight, and industry's heightened safety awareness since the *Deepwater Horizon* oil spill (as noted below), it is reasonable to conclude that an accidental spill event of similar magnitude is unlikely to occur. Events that are statistically unexpected to occur, but would still be possible but exceedingly unlikely, such as a catastrophic discharge event, and are not considered a part of the proposed activities and, therefore, are not discussed in detail in this document. For more information on a low-probability catastrophic event and the resulting analysis of potential effects, refer to BOEM's *Gulf of Mexico Catastrophic Spill Event Analysis* technical report (BOEM 2021b), incorporated by reference herein.

**Oil and Gas Production Safety Systems**

On September 28, 2018, BSEE published revisions to the 2018 Oil and Gas Production Safety Systems Rule, which became effective on December 27, 2018 (83 FR 49216), and on May 2, 2019, BSEE published revisions for the 2019 Well Control and Blowout Preventer Rule, which became effective on July 15, 2019 (84 FR 21908). On August 23, 2023, BSEE published a

final rule revising certain regulatory provisions published in the 2019 final well control rule for drilling, workover, completion, and decommissioning operations, which became effective on October 23, 2023 (88 FR 57334). For purposes of this site-specific analysis, BOEM has evaluated the regulatory changes and agrees with BSEE's conclusions that the rule changes do not change or increase environmental risks from what they were under the 2016 or 2019 rules. BOEM agrees because the changes to the rules carefully removed unnecessary burdens while leaving critical safety provisions intact and did not change the overall risks related to oil and gas activities on the OCS. These updates were also accounted for in the 2025 PEIS analysis, from which this SEA tiers.

# 2 ALTERNATIVES CONSIDERED

## 2.1 NO ACTION

**Alternative 1** – If selected, Shell would not be authorized to undertake the proposed activities and the application would be denied. If the proposed activities are not undertaken, they would not cause activity-specific routine or accidental impacts. Activities related to other existing leases, authorizations, and permits associated with the overall OCS activities would not increase. The No Action Alternative would not significantly change the environmental impacts of overall OCS oil and gas exploration and development activities as described in the 2025 PEIS, and routine impacts would continue to occur elsewhere on the OCS, as could impacts from accidental events on other OCS leases. However, these activities on this lease block would not occur as described in N-10269. Selecting the No Action Alternative would not preclude the lessee from submitting a new application for proposed activities on the lease, which would entail a separate, independent review and site-specific NEPA analysis before a decision is made.

## 2.2 PROPOSED ACTION

**Alternative 2** – If selected, Shell would be authorized to undertake the proposed activities as requested in N-10269. Related activities conducted in State waters or onshore would be subject to State and local regulations. The lessee/operator would conduct operations in accordance with the lease stipulations; OCSLA; and all Federal regulations (as per 30 CFR § 550.101(a)); guidance provided in all appropriate NTLs (as per 30 CFR § 550.103); and applicable Project Criteria. These consist of the following:

- **MARINE DEBRIS PROJECT CRITERIA:** The applicant will follow the project criteria provided under The Bureaus' Marine Debris Project Criteria.
- **VESSEL STRIKE AVOIDANCE AND INJURED AND/OR DEAD AQUATIC PROTECTED SPECIES REPORTING PROJECT CRITERIA:** The applicant will follow the project criteria provided under The Bureaus' Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Project Criteria.
- **IN-WATER LINE PRECAUTION PROJECT CRITERIA:** The applicant will follow the project criteria provided under The Bureaus' In-water Line Precaution Project Criteria.
- **MOON POOL MONITORING PROJECT CRITERIA:** The applicant will follow the protocols provided under The Bureaus' Moon Pool Monitoring Project Criteria.
- **VESSEL TRANSIT WITHIN THE RICE'S WHALE AREA AS IDENTIFIED IN THE 2020 BIOLOGICAL OPINION'S REASONABLE AND PRUDENT ALTERNATIVE (2020 RWA):** The applicant will follow the project criteria provided under The Bureaus' Vessel Transit within the Rice's Whale Area as identified in the 2020 Biological Opinion's Reasonable and Prudent Alternative (2020 RWA).
- **SEA TURTLE RESUSCITATION GUIDELINES PROJECT CRITERIA:** The applicant will follow the project criteria provided under The Bureaus' Sea Turtle Resuscitation Guidelines Project Criteria.

**SEE APPENDIX B FOR FULL DESCRIPTIONS OF THE PROJECT CRITERIA**

## 2.3 SUMMARY AND COMPARISON OF THE ALTERNATIVES

If selected, Alternative 1, No Action Alternative, would result in Shell not exercising its rights under the lease and conducting the proposed activities. Alternative 1 would not result in any immediate activity-specific impacts to the human environment, and the lessee may not develop or continue to develop the oil and gas resources of its lease. Alternative 1 does not meet the underlying purpose and need as defined in **Chapter 1.2** because the potential oil and gas resources at this site would not be explored and, thus, may not be developed.

Alternative 2 would result in the lessee/designated operator being authorized to conduct proposed activities. Alternative 2 is BOEM's preferred alternative as it allows the lessee to achieve its exploration objectives and incorporates mitigation and monitoring requirements (as components of project design) to minimize or negate potential environmental impacts. **Table 2-1** provides an overall summary of impacts to resources.

Table 2-1. Summary of Alternatives and Potential Impacts to Resources

| Resource | Alternative 1: No Action | Alternative 2: Proposed Action |
|---|---|---|
| Marine Mammals | None | Negligible to Moderate |
| Sea Turtles | None | Negligible to Minor |
| Air Quality | None | Negligible to Minor |
| Archaeology* | None | Negligible |
| Benthic Communities* | None | Negligible |
| Birds* | None | Negligible |
| Fish and EFH* | None | Negligible |
| Human/Socioeconomic Resources* | None | Negligible |
| Other Marine Uses* | None | Negligible |
| Water Quality* | None | Negligible |

None – The action has no effects on the resource.

Negligible - Impacts may or may not cause observable changes to natural conditions; does not reduce the integrity of the resource.

Minor - Impacts cause observable and short-term changes to natural conditions but does not reduce the integrity of the resource.

Moderate - Impacts cause observable and short-term changes to natural conditions and/or reduces the integrity of the resource.

Major - Impacts cause observable and long-term changes to natural conditions and reduces the integrity of the resource.

NOTE: The descriptions above are a general summary/definition of the overall impacts. Refer to each specific resource in Chapter 3 for a more detailed impact-level definition.

* Denotes resources eliminated from detailed analysis

Based on this site-specific analysis, BOEM's other environmental reviews under OCSLA and NEPA, and adherence to all required mitigation measures and regulatory guidance incorporated into the Proposed Action, no additional alternatives were carried forward for detailed analysis.

# 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

## 3.1 INTRODUCTION

The discussion below will briefly describe/summarize the pertinent affected resources, discuss the site-specific review that was conducted, and provide the analysis of the proposed activities' potential impacts to the human environment. The description of the affected environment and impact analysis are presented together in this chapter for each resource. For the impact analysis, resource-specific significance criteria was developed for each resource category.

A detailed description of resources on the OCS, along with a detailed impact analysis of the routine and accidental impacts of the proposed activities on these resources, can be found in Chapter 4 of the 2025 PEIS, from which this SEA tiers. Additional supporting analyses and descriptions are included in the BEBR, Oil and Gas SID, and Gulf of Mexico Catastrophic Spill Event Analysis, which are incorporated by reference for all resources discussed below. Throughout this SEA, where information is incomplete or unavailable and cannot be obtained within a reasonable cost or timeframe, or the means to obtain it are unknown, BOEM makes clear that such information is lacking and where possible, makes use of reliable existing data and resources in its place. BOEM has determined that it can make an informed decision at this time with the information currently available. BOEM's subject-matter experts have applied scientifically credible information using accepted theoretical approaches and research methods, such as information on related or surrogate species, where appropriate.

### 3.1.1 Potentially Affected Resources

Preliminary screening for this assessment was based on a review of the relevant literature, previous SEAs, the 2025 PEIS, and statistics/data pertinent to historic and projected activities. For this SEA, BOEM evaluated the site-specific impacts that may result from the operator's proposed activities and identified the following potentially affected resources:

- marine mammals (including both ESA-listed and non-listed species)
- sea turtles (all are ESA-listed species)
- air quality

### 3.1.2 Resources Not Affected or Negligibly Impacted

Based on the site-specific review and impact conclusions reached, the following resources are scoped out of this SEA on the basis that the Proposed Action would not have an impact on the resource because the resource is not present within the proposed activity area and/or the proposed activities would have no impact/effect or no more than a negligible impact (**Table 3-1**).

Table 3-1. Resources Not Included for Further Analysis

| Resource | Description | Reason For No Further Analysis |
|---|---|---|
| **Water Quality** | BOEM requires projected waste and discharge information for specific proposed activities to be submitted in an exploration plan, as outlined by NTL 2008-G04. The U.S. Environmental Protection Agency (USEPA) Regions 4 and 6 regulate the discharge of routine operational waste streams generated from offshore oil- and gas-related activities. Section 403 of the Clean Water Act (CWA) requires that National Pollutant Discharge Elimination System (NPDES) permits be issued for discharges to the ocean in compliance with USEPA's regulations for preventing unreasonable degradation of the receiving waters. The NPDES permits specify effluent limitations and monitoring requirements for discharges associated with offshore oil and gas extraction activities. There are two general NPDES permits that cover the OCS. Permit GMG290000, issued by USEPA Region 6, covers the Western Planning Area (WPA) and CPA; Permit GEG460000, issued by USEPA Region 4, covers the Eastern Planning Area (EPA) and a small part of the CPA. BSEE has regulatory authority through 30 CFR § 250.300 to prevent and control water pollution. BSEE's Office of Environmental Compliance performs inspections to support the USEPA. | The proposed exploration activities are located on Mississippi Canyon Block 477, which is located approximately 67 mi (108 km) from the nearest coastline off Terrebonne Parish, Louisiana. Mississippi Canyon Block 477 is within USEPA Region 6 and falls under the requirements of NPDES Permit GMG290000. Discharges authorized under the NPDES permit would have no effect to negligible impact on the pH, temperature, dissolved oxygen content, salinity, oxidation-reduction potential, or turbidity of the water. Furthermore, any hydrocarbons present in discharges that meet the NPDES permit would be below concentrations that would produce physical or chemical changes to water quality. In addition to permitted discharges, unpermitted spills may occur. BOEM has previously estimated that most accidental spills will be less than 50 bbl in volume, based on historical spill rates and projected OCS activity. Potential impacts on resources from these small spills would be rendered negligible by natural processes such as weathering and dispersion that would degrade the spill products. Water quality is also degraded by trash and debris. Activities proposed will comply with Federal regulations and the requirements in applicable Project Criteria for Marine Debris to reduce the potential for trash and marine debris from the proposed activities, which reduces the potential impacts to negligible. |
| **Benthic Communities** | Benthic fauna inhabit the seafloor throughout the OCS at all water depths. In shallow water (<984 ft [300 m]), naturally occurring geological or biogenic seafloor with measurable vertical relief serves as important habitat for a wide variety of sessile and mobile marine organisms. Corals in the region that are protected under the ESA include elkhorn coral, staghorn coral, boulder star coral, lobed star coral, and mountainous star coral. In deep water (>984 ft [300 m]), chemosynthetic communities form around natural hydrocarbon seepages. Deepwater coral communities can co-occur on hard substrates near hydrocarbon seeps with chemosynthetic organisms and routinely colonize other hard substrates. | Based on review of the geophysical surveys, BOEM Seismic Anomalies database, and N-10269, no known or mapped benthic resources were identified within the proposed activity area; therefore, with existing regulatory requirements in place, the potential impact is negligible and no additional mitigation or monitoring measures are applied. Activities proposed will comply with Federal, State, and local regulations and NTLs to reduce the risk for potential for accidental events; therefore, potential impacts to benthic communities from accidental events are negligible. |

| Resource | Description | Reason For No Further Analysis |
|---|---|---|
| **Archaeological Resources** | BOEM is required under 36 CFR § 800.4(b)(1) to make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. BOEM regulation 30 CFR § 550.194 requires an operator to submit an archaeological report based on high-resolution geophysical survey analyzing the potential for an undertaking to adversely effect archaeological resources. To mitigate adverse impacts to these resources, BOEM requires that the operator either avoid the features identified as possible archaeological resources in the operator's archaeological report or establish to the satisfaction of the Regional Director that an archaeological resource does not exist or will not be adversely affected by operations. Mitigation of adverse impacts to archaeological resources determined to be significant under 36 CFR § 60.4 within the identified Area of Potential Effect may be determined following consultation with the Advisory Council on Historic Preservation and appropriate State Historic Preservation Offices per 36 CFR § 800.6. Under 30 CFR § 550.194(c), lessees are required to immediately halt seafloor disturbing operations within 1,000 feet of the resource and notify BOEM's Regional Director of the discovery of any potential archaeological resources. | Based on review of the archaeological survey and additional data, no potential archaeological resources were identified within the Proposed Action area. Therefore, with existing regulatory requirements in place, the potential impact is negligible to minor and no additional mitigation or monitoring measures are applied. |
| **Fish and Invertebrate Resources and Essential Fish Habitat** | Fish and invertebrate resources refers to all estuarine and marine fish and invertebrates endemic to the region, with a particular emphasis on species of ecological and economical significance. EFH refers to all waters and substrate necessary for spawning, breeding, feeding, and growth to maturity for federally managed fisheries species on the OCS (16 U.S.C. §§ 1801 *et seq.*). | The proposed activities in Mississippi Canyon Block 477 will not occur within delineated EFH and will not occur within specified distances of deepwater benthic communities that would trigger a project-specific EFH consultation (i.e., minimum separation distances described in NTL-2009-G40). Minimum distance requirements were cooperatively developed by BOEM and NMFS during past programmatic EFH consultations for bottom-disturbing activities occurring near sensitive benthic habitats. Overall, N-10269 is expected to have negligible population-level impacts to fish and invertebrate resources in the OCS, as well as EFH due to the localized, short-term nature of the proposed activities. Therefore, no site-specific avoidances or mitigations are applied. |

| Resource | Description | Reason For No Further Analysis |
|---|---|---|
| **Marine and Coastal Birds** | Several bird groups use the U.S. Gulf environment, because the area serves multiple habitat and life staging purposes. Birds from six distinct taxonomic and ecological groups are represented within the region, including passerines (i.e., Passeriformes), raptors (i.e., Falconiformes, Accipitriformes), seabirds (i.e., Charadriiformes, Pelecaniformes, Procellariiformes, Gaviiformes, Podicipediformes), waterfowl (i.e., Anseriformes, Gaviiformes), shorebirds (i.e., Charadriiformes), and wading or marsh birds (i.e., Ciconiiformes, Gruiformes). Currently, nine federally listed protected bird species occur in the northern Gulf: Cape Sable seaside sparrow; Mississippi sandhill crane; piping plover; rufa red knot; roseate tern; whooping crane; wood stork; eastern black rail; and black-capped petrel. | Overall, reasonably foreseeable impacts to birds from routine activities are expected to be not significant. Potential impacts from routine activities could include behavioral effects, exposure to or intake of OCS oil- and gas-related contaminants and discarded debris, sublethal chronic effects from air emissions, mortality and energetic costs associated with structure presence and associated lighting, disturbance-related impacts, and displacement of birds from habitats that are destroyed, altered, or fragmented, thus making these areas temporarily unavailable. Also, secondary impacts from pipeline and navigation canals to coastal habitats will occur over the long term and may temporarily displace birds to other habitats. |
| **Human/ Socioeconomic Resources** | The coastal zone of the OCS is not a physically, culturally, or economically homogenous unit. The counties and parishes along the Gulf Coast cover approximately 1,631 mi (2,625 km) and includes multiple uses for recreational activities (beaches), deepwater ports, oil and gas support industries, manufacturing, farming, ranching, and hundreds of thousands of acres of wetlands and protected habitat. Offshore oil and gas activities affect onshore areas because of the various industries involved and because of the complex supply chains for these industries. Many of these impacts occur in counties and parishes along the coastal region. Employment stability in the oil and gas industry and its support sectors correlates directly with fluctuations in OCS oil- and gas-related activity levels, which are, in turn, closely related to the changes in oil and gas commodity prices. | The potential impacts resulting from the industry's routine activities occur within the larger socioeconomic context of the region. Given the existing, extensive, and widespread support system for the OCS oil- and gas-related industry and its associated labor force, the impacts of routine activities related to a single lease sale are expected to be negligible, widely distributed, and to have little impact. Routine activities related to a single Proposed Action would be incremental in nature, not expected to change existing conditions, and positive in their contribution to the sustainability of current industry, related support services, and associated employment.<br>No new or expansion of existing shore bases or onshore support infrastructure and facilities is planned as part of the Proposed Action; therefore, potential impacts are negligible. |
| **Other Marine Uses** | The marine environment is used for a variety of activities and overlaps or conflicts can occur with multiple uses and/or users. The region is very active with existing multiple users and designated uses, including oil and gas activities, fishing (commercial or recreational), shipping, military, SSRA blocks, and artificial reefs. Future activities may include renewable energy development, aquaculture, and other alternative uses. | The Proposed Action would have no to negligible impacts on other marine uses, and no additional mitigation or monitoring measures are applied. |

## 3.2 MARINE MAMMALS

### 3.2.1 Affected Environment

Twenty-one species of cetaceans (baleen and toothed whales) and one species of Sirenia (i.e., manatee) regularly occur in the region and are identified in the NMFS Marine Mammal Stock Assessment Reports (Hayes et al. 2025). A description of marine mammals can be found in Chapter 4.8 of the 2025 PEIS, from which this SEA tiers, with additional information in Chapter 3.7 of the BEBR, which is incorporated by reference.

The proposed action is located in Mississippi Canyon Block 477, 67 mi (108 km) from the shore in water depths of 6,941 - 6,944 ft (2,116 - 2,117 m).

**Threatened or Endangered Marine Mammal Species**

Two cetacean species, the sperm whale (*Physeter macrocephalus*) and the Rice's whale (*Balaenoptera ricei*), regularly occur in the region and are listed as endangered under the ESA. The Florida manatee (*Trichechus manatus latirostris*), a subspecies of the West Indian manatee (*Trichechus manatus*), has been documented all along the Gulf in nearshore waters, typically less than 4 m (13 ft) deep and within 1,000 m (328 ft) of the shore (Slone et al. 2022). West Indian manatees are currently listed as threatened; the Florida manatee subspecies is proposed to be listed as threatened, and the Antillean manatee (*Trichechus manatus manatus*) subspecies as endangered, which would replace the listing of the West Indian manatee (90 FR 3131). Florida manatee critical habitat is currently designated in Florida (42 FR 47840), and critical habitat revisions are proposed (89 FR 78134). The sperm whale was listed as endangered throughout its range on December 2, 1970. The GOM Bryde's (now Rice's) whale was listed as endangered on May 15, 2019 (84 FR 15446). The Rice's whale critical habitat is currently proposed by NMFS in the northern Gulf from the 100 to 400 m (328 to 1,312 ft) isobath (88 FR 47453).

The only resident baleen whale in the northern Gulf is the Rice's whale. The majority of Rice's whale detections are limited to the northeastern Gulf along the continental shelf between roughly 100 and 400 m (328 to 1,312 ft) depths (Garrison et al. 2024; NOAA Fisheries 2026; Rosel et al. 2021), though they have been detected less frequently in the central, western, and southern Gulf (NOAA Fisheries 2024; 2026; Rappucci et al. 2023; Soldevilla et al. 2022; Soldevilla et al. 2024). Predicted densities and occurrence of Rice's whales remain highest in their northeastern Gulf habitat (Farmer et al. 2022; Garrison et al. 2024). Sperm whales in the region are not evenly distributed, showing greater densities in areas associated with oceanic features that provide the best foraging opportunities (Garrison et al. 2018).

**Non-ESA-Listed Marine Mammal Species**

Nineteen toothed cetaceans (including beaked whales and dolphins) regularly occur in the region that are not ESA-listed (Hayes et al. 2025). Despite being non-listed, the Marine Mammal Protection Act of 1972 (MMPA) protects all marine mammals regardless of ESA status.

**Unusual Mortality Event (UME)**

Under the MMPA, an UME is defined as "a stranding that is unexpected; involves a significant die-off of any marine mammal population; and demands immediate response." There are currently no active UMEs in the Gulf region. A list of active and closed UMEs with updated information can be found at the following website: Active and Closed Unusual Mortality Events.

### 3.2.2 Impact Analysis

The IPFs with the proposed activities in the project area (Mississippi Canyon Block 477) that could affect marine mammals include (1) noise (drilling and/or production and vessel/aircraft noise and use of impact driving equipment), (2) vessel strike, (3) entanglement and entrapment, (4) marine trash and debris, and (5) oil/chemical spills and oil spill response. For this SEA, impacts were evaluated and assigned levels of environmental impact caused by IPFs as listed below. **Table 3-2** provides a summary of the impact analysis for marine mammals.

- **None** – The action has no effect.
- **Negligible** – An individual or group of animals would be subject to nominal to slight measurable impacts. No mortality or injury to any individual would occur, and no disruption of behavioral patterns would be expected. The disturbance would last only as long as the human-caused stimulus was perceptible to the individual or group.
- **Minor** – An individual or group of animals would be subject to a human-caused stimulus and would be disturbed, resulting in an acute behavioral change. No mortality or injury to an individual or group would occur.
- **Moderate** – An individual or group of animals would be subject to a human-caused stimulus and would be disturbed, resulting in a chronic behavioral change. Individuals may be impacted but at levels that do not affect the fitness of the population. Some impacts to individual animals may be irreversible.
- **Major** – An individual or group of animals would be subject to a human-caused stimulus, resulting in physical injury or mortality, and would include sufficient numbers that the continued viability of the population is diminished, including annual rates of recruitment or survival. Impacts would also include permanent disruption of behavioral patterns that would affect a species or stock.

Table 3-2. Summary of Impact Levels to Marine Mammals

| Activity Initial | Impact-Producing Factor | Magnitude of Potential Impact Alternative 1 | Magnitude of Potential Impact Alternative 2 |
|---|---|---|---|
| Routine Activities | Noise | None | Negligible |
| Accidental Events | Vessel Strike | None | Negligible to Moderate |
| Accidental Events | Marine Trash and Debris | None | Negligible |
| Accidental Events | Oil/Chemical Spills | None | Negligible to Minor |
| Accidental Events | Response Activities | None | Negligible to Minor |
| Accidental Events | Entanglement and Entrapment | None | Negligible |

#### 3.2.2.1 Alternative 1

If selected, Alternative 1, No Action Alternative, would result in the operator not undertaking the proposed activities as described in the plan. Therefore, the direct or indirect activity-specific IPFs to marine mammals would not occur. Activities related to previously issued leases and permits (as well as those that may be issued in the future under a separate decision) related to OCS activities would not increase. The No Action Alternative would not contribute to the environmental impacts of overall OCS oil- and gas-related activity as described in the 2025 PEIS, and routine and accidental impacts would still occur from other activities.

#### 3.2.2.2 Alternative 2

If selected, Alternative 2, Proposed Action, would result in the operator undertaking the proposed activities as requested and conditioned in the plan. The operator will adhere to the applicable Marine Debris Project Criteria, Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Project Criteria, Moon Pool Monitoring Project Criteria, A.6 Vessel Transit within the Rice's Whale Area as identified in the 2020 Biological Opinion's Reasonable and Prudent Alternative (2020 RWA), and n-Water line Precautions Project Criteria (Shell, 2026). Compliance with the regulations, and applicable Project Criteria are expected to negate or lessen the chance of moderate to major impacts on marine mammals under this alternative.

### 3.2.3 Routine Activities

**Noise**

Vessel noise from the Proposed Action will produce low levels of noise, generally in the 150 to 170 decibels (dB) re 1 µPa-m (dB referenced to 1 micropascal at a distance of 1 meter) at frequencies below 1,000 hertz (Hz). Vessel and equipment noises are transitory and generally do not propagate at great distances from the vessel. The intensity of noise from vessels is roughly related to ship size and speed (Erbe et al. 2019). For a given vessel, relative noise tends to increase with increasing speed. A comprehensive review of the literature on marine

mammals and vessel noise (Erbe et al. 2019; Erbe et al. 2025) revealed that changes in behavior vary widely across species and are heavily dependent on context. Vessel noise could interfere with marine mammal communication either by masking important sounds from conspecifics (a member of the same species), masking sounds from predators, or it may trigger animals to alter their vocalizations (Tyack 2008). There is the possibility of short-term disruption of movement patterns and/or behavior caused by vessel noise and disturbance. Therefore, vessel noise associated with the proposed action is not expected to significantly affect marine mammals.

According to Southall et al. (2007; 2019; 2021), for behavioral responses to non-impulsive noise sources (e.g., drill noise), data indicate considerable variability in received levels associated with behavioral responses. Further, research suggests that the sensitivity of marine mammals to drilling noise varies between and within species and is likely context-dependent (Richardson et al. 1990). The source levels from drilling (154 dB and below, as cited by Greene, 1986 in Richardson et al. 1995) are below the auditory injury onset criteria established by NMFS (NMFS 2024). While behavioral responses may result from offshore drilling, they are expected to be short-term and intermittent. Since drilling associated with the proposed action would be temporary and localized, and considering the wide range of marine mammals in the Gulf, marine mammals are not expected to be significantly affected by drilling noise. In addition to various pieces of support equipment used in construction, such as vessels and cranes, pile driving is the primary method by which fixed structures are attached to the seafloor and provide stability for other support structures. There are two primary pile driving operations on the OCS: (1) the setting of casing conductors (also known as drive pipe) for drilling operations, and (2) pile emplacement for securing oil and gas structures and facilities to the sea bed. The highest reported source levels for pile driving are 204 dB (sound exposure level (SEL)) and 232 dB (peak). Since these occurrences would be temporary, and given the applicable required mitigation measures per applicable Project Criteria, marine mammals are not expected to be significantly affected by pile driving.

Helicopter noises contain dominant tones (resulting from rotors) generally below 500 Hz (Richardson et al. 1995). Air traffic may elicit a startle response and interrupt marine mammals at the surface (depending on the activity of the animals; Richardson et al. 1995). Aircraft noise is generally short in duration and transient in nature, although it may ensonify large areas. Much of the noise from a passing aircraft is reflected and does not penetrate the air-water interface (Urick 1972). The Proposed Action is expected to have helicopter support with multiple transits between the MODU and airbase. Since these occurrences would be temporary and pass within seconds, and given the relevant guidelines and regulations, marine mammals are not expected to be adversely affected by routine helicopter traffic operating at prescribed required Federal Aviation Administration altitudes.

Marine mammals may exhibit some avoidance behaviors, but their behavioral or physiological responses (e.g., stress) to noise associated with the Proposed Action are unlikely to have population-level- impacts. Therefore, impacts to marine mammals from noise associated with the proposed activities are expected to be negligible.

### 3.2.4 Accidental Events

**Vessel Strike**

All marine mammals are vulnerable to accidental vessel strike; however, some marine mammal species may be more vulnerable than others, including primarily slow-moving species (e.g., manatees) or those that spend extended periods of time at the surface (e.g., Rice's whales), and deep-diving species (e.g., sperm whales) while on the surface (Vanderlaan and Taggart 2007). For example, Rice's whales may spend up to 88 percent of their time at night, and 70 percent of their time overall, within 15 m (39 ft) of the ocean surface (Soldevilla et al. 2017), making them vulnerable to collisions with large vessels (Stevens et al. 2024).

Accidental vessel strike on a marine mammal can result in injury, mortality, or even no apparent effects depending on the circumstances (Laist et al. 2001; Pace 2011; Van Waerebeek et al. 2007; Vanderlaan and Taggart 2007). Several factors affect the risk and severity of vessel strike to marine mammals, including species type, speed, health, and behavior of the animal; and the path, speed, size, and number of vessels (Laist et al. 2001; Martin et al. 2016; Vanderlaan and Taggart 2007). Vessel speed and vessel size are of note when assessing strike risk; larger vessels at higher speeds pose the most risk for strike on marine mammals (Garrison et al. 2025; Stevens et al. 2024). Most severe and lethal whale injuries involve large ships (>80 m [262 ft]) at higher speeds: 89 percent of ship strike records show that vessels were moving >14 kn (16 mph); most strikes occurred over or near the continental shelf; and the whales were usually not seen beforehand or seen too late to be avoided (Laist et al. 2001; Van Waerebeek et al. 2007).

The operator has not proposed any vessel transits within the Rice's Whale Area defined by NMFS. Per the Vessel Transit within the Rice's Whale Area as identified in the 2020 Biological Opinion's Reasonable and Prudent Alternative (2020 RWA), the operator is required to provide notification and concurrence to fulfill the reporting requirements to BOEM and BSEE prior to any vessel transit changes that propose entering the 2020 RWA. In addition, adherence to the Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Project Criteria would prevent or substantially reduce marine mammal interactions with vessels by requiring separation distances, speed restrictions, and the use of onboard observers for monitoring during certain activities. NMFS also provides all boat operators with whale watching guidelines, which are derived from the MMPA. These guidelines suggest safe navigational practices based on speed and distance limitations when encountering marine mammals. With these protocols in place, and considering the wide geographic range and movements of marine mammals in the Gulf, impacts to marine mammals from vessel strike are expected to be negligible to moderate.[8]

[8] In the unlikely (i.e., not reasonably foreseeable) event of a strike on an ESA-listed whale that results in mortality, the determination could be major.

**Marine Trash and Debris**

Entanglement in marine debris could lead to injury, infection, reduced mobility, increased susceptibility to predation, decreased feeding ability, fitness consequences, and mortality (e.g., drowning) (Gall and Thompson 2015; Senko et al. 2020). In addition, marine debris ingestion could lead to intestinal blockage, which can affect feeding ability and lead to injury or death (Gall and Thompson 2015; Senko et al. 2020). Operators are required to follow BSEE, USCG, and USEPA regulations pertaining to marine trash and debris prevention and handling. With adherence to these regulations and the Marine Debris Project Criteria, which is designed to prevent or minimize accidental marine debris, impacts to marine mammals from marine debris are expected to be negligible.

**Oil/Chemical Spills and Oil-Spill Response**

Historical trends in the Gulf show that the frequency of oil spills has decreased substantially over the last two decades, and most spills are categorized as small (i.e., less than 1,000 bbl; ABS Consulting Inc. 2016; Anderson and LaBelle 1990; Anderson et al. 2012). Improvements in technology, industry practice, and regulations have contributed in part to decreased spill risk. Potential impacts of an oil spill depend on a variety of factors, such as spill magnitude, frequency, timing, location, and the meteorological and oceanographic conditions at the time (National Research Council 2003). Further, the impacts of an oil spill could depend on oil characteristics; time of year; response efforts (e.g., burning, dispersant); and types of habitats, as well as the behavior and physiology of the marine mammals themselves (Johnson and Ziccardi 2006; Sullivan et al. 2019; Ziccardi et al. 2015). Marine mammals could experience decreased health, reproductive fitness, and longevity, increased vulnerability to disease, and possibly mortality. The oil from a spill can adversely affect marine mammals by causing soft-tissue irritation, fouling of baleen plates, respiratory stress from the inhalation of toxic fumes, food reduction or contamination, direct ingestion of oil and/or tar, and temporary displacement from preferred habitats. There is evidence that some species of marine mammals can metabolize hydrocarbons (Engelhardt 1983; Lee and Anderson 2005). However, the extent to which species metabolize and eliminate hydrocarbons, and the specific gene biomarker pathways used are unclear (Ruberg et al. 2021). An oil spill may physiologically stress an animal (Geraci and St. Aubin 1980), making it more vulnerable to disease, parasitism, environmental contaminants, and predation. Because the potential occurrence of a spill and contact with species is low due to applicable regulatory requirements (refer to **Chapter 1.5**) in this plan submittal, and considering the wide geographic range and movement of marine mammals in the Gulf, the effects on marine mammals from oil/chemical spills are expected to be negligible to minor.

**Response Activities**

When deemed necessary, the removal methods used during any spill would be determined by the USCG's Federal On-Scene Coordinator (FOSC) and representatives of the Regional Response Team (RRT) or National Response Team (NRT); therefore, accidental event

response activities would be conducted on a case-by-case basis, as outlined in BP's approved regional OSRP. Response activities could cause increased human presence in the water after an oil spill (e.g., vessels) which could contribute to changes in behavior and/or distribution, thereby potentially stressing marine mammals further and perhaps making them more vulnerable to various physiological and toxic effects of spilled oil. Response vessels could increase the risk of vessel strike. Removing oil from the surface would reduce the risk of contact and render it less likely to adhere to skin, baleen plates, or other body surfaces (Neff 1990).

One assumption concerning the use of dispersants is that the chemical dispersion of oil would considerably reduce the impacts to marine mammals, primarily by reducing their exposure to petroleum hydrocarbons (French-McCay 2004; National Research Council 2005). The acute toxicity of most oil dispersant chemicals is low relative to the constituents and fractions of crude oil and refined products. Dispersants may be irritants to tissues and sensitive membranes (National Research Council 2005). Impacts through skimmers could be through capture and/or entrainment. In-situ burns could impact some marine mammals if they were in the burning oil; however, it is expected that animals would avoid the area once it is ignited. In both skimming and controlled burning activities, the use of trained observers is common. Based on BOEM's review of the applicable scientifically credible information available, the low potential for a spill to occur and contact a species due to applicable regulatory requirements (refer to **Chapter 1.5**), and considering the wide geographic range and movement of marine mammals in the Gulf, the effects on marine mammals from response activities are expected to be negligible to minor.

**Entanglement and Entrapment**

Entanglement, such as from lines in the water, and entrapment can result in stress, injury, or death of marine mammals (Gall and Thompson 2015; Moore et al. 2009; Senko et al. 2020). Entangled marine mammals may drown or starve due to being restricted by gear, suffer physical trauma and systemic infections, and/or be hit by vessels due to an inability to avoid them. Moon pools are too small to allow a marine mammal in the Gulf to enter and are therefore highly unlikely to entrap them. The operator will adhere to the In-Water Line Precaution Project Criteria and the Moon Pool Monitoring Project Criteria which appreciably reduce the likelihood of marine mammals being entangled or entrapped in gear from the proposed activity (Shell, 2026). With applicable required protocols per the Project Criteria, marine mammal entanglement in gear associated with the proposed activity is unlikely to occur since lines in the water would be taut as required to prevent looping and tangling. Thus, because the possibility of entanglement and entrapment is low and since the operator will adhere to the applicable Project Criteria, the effects on marine mammals are expected to be negligible.

**Conclusion**

Long-term or permanent displacement of marine mammals from preferred habitats and the destruction or adverse modification of any habitats are not expected to occur due to the

scope, timing, and the short-term nature of the proposed development activities, and considering the wide-ranging movements and behaviors of marine mammals. Furthermore, application of the applicable Project Criteria in addition to other relevant regulations, would prevent or minimize potential effects to marine mammals from the above discussed IPFs. Based on the above analysis, BOEM finds that the potential effects from the Proposed Action are unlikely to rise to significant levels.

## 3.3 SEA TURTLES

### 3.3.1 Affected Environment

Five sea turtle species, all federally listed as threatened or endangered, are known to inhabit the waters of the Gulf OCS: leatherback (*Dermochelys coriacea*); green (*Chelonia mydas*); hawksbill (*Eretmochelys imbricata*); Kemp's ridley (*Lepidochelys kempii*); and loggerhead (*Carettra caretta*). These species are all highly migratory, and individual animals will migrate into nearshore waters as well as other areas of the North Atlantic Ocean, Gulf, and Caribbean Sea. The North Atlantic DPS of green turtle is ESA-listed as threatened. Hawksbill turtles, Kemp's ridley turtles, leatherback turtles, and the Northwest Atlantic Ocean Distinct Population Segment (DPS) of loggerhead turtle are ESA-listed as endangered. Floating *Sargassum* patches are federally designated under the ESA as critical habitat for loggerhead turtles (79 FR 39856) and proposed for green turtles (88 FR 46572). Garrison et al. (2020) found that spatial and seasonal variation in loggerheads in the northern Gulf represents the shift in habitats and behavioral modes across seasons, with animals moving into deeper waters and spending progressively less time at the surface during cooler months. Further, Lamont and Hart (2023) found that time at the surface was greater for loggerhead, Kemp's ridley, and green turtles in summer, though did not differ between BOEM's EPA and CPA, except for Kemp's ridleys, which spent more time at the surface in the WPA than the EPA. A complete description of sea turtles can be found in Chapter 4.9 of the 2025 PEIS, from which this SEA tiers, with additional information in Chapter 3.6 of the 2021 BEBR, which is incorporated by reference.

### 3.3.2 Impact Analysis

Sea turtles are susceptible to many natural and human impacts, including impacts while on land, in the benthic environment, and in the pelagic environment due to their life history. The IPFs associated with the proposed activities in Mississippi Canyon Block 477 that could affect sea turtles include (1) noise (drilling and/or production and vessel/aircraft noise and use of impact-driver equipment), (2) vessel strike, (3) entanglement and entrapment, (4) marine trash and debris, and (5) oil/chemical spills and oil-spill response. For this SEA, impacts were evaluated and assigned levels of environmental impact caused by IPFs as listed below. **Table 3-3** provides a summary of impact to sea turtles.

- **None** – The action has no effect.
- **Negligible** – An individual or group of animals would be subject to nominal to slight measurable impacts. No mortality or injury to any individual would occur, and no disruption of behavioral patterns would be expected. The

disturbance would last only as long as the human-caused stimulus was perceptible to the individual or group.

- **Minor** – An individual or group of animals would be subject to a human-caused stimulus and would be disturbed, resulting in an acute behavioral change. No mortality or injury to an individual or group would occur.
- **Moderate** – An individual or group of animals would be subject to a human-caused stimulus and would be disturbed, resulting in a chronic behavioral change. Individuals may be impacted but at levels that do not affect the fitness of the population. Some impacts to individual animals may be irreversible.
- **Major** – An individual or group of animals would be subject to a human-caused stimulus, resulting in physical injury or mortality, and would include sufficient numbers that the continued viability of the population is diminished, including annual rates of recruitment or survival. Impacts would also include permanent disruption of behavioral patterns that would affect a species or stock.

Table 3-3. Summary of Impact Levels to Sea Turtles

| Activity Initial | Impact-Producing Factor | Magnitude of Potential Impact Alternative 1 | Magnitude of Potential Impact Alternative 2 |
|---|---|---|---|
| Routine Activities | Noise | None | Negligible |
| Accidental Events | Vessel Strike | None | Negligible to Minor |
| Accidental Events | Marine Trash and Debris | None | Negligible |
| Accidental Events | Oil/Chemical Spills | None | Negligible to Minor |
| Accidental Events | Response Activities | None | Negligible to Minor |
| Accidental Events | Entanglement and Entrapment | None | Negligible |

#### *3.3.2.1* Alternative 1

If selected, Alternative 1, No Action alternative, would result in the operator not undertaking the proposed activities as described in the plan. Therefore, direct or indirect activity-specific IPFs to sea turtles would not occur. Activities related to previously issued leases and permits (as well as those that may be issued in the future under a separate decision) related to the OCS activities would not increase. The No Action Alternative would not contribute to the environmental impacts of overall OCS oil- and gas-related activity as described in the 2025 PEIS, and routine and accidental impacts would still occur from other activities.

#### *3.3.2.2* Alternative 2

If selected, Alternative 2, Proposed Action, would result in the operator undertaking the proposed activities as requested and conditioned in the plan, and applicable regulations. The operator will adhere to the Marine Debris Project Criteria, Vessel Strike Avoidance and Injured

and/or Dead Aquatic Protected Species Reporting Project Criteria, Moon Pool Monitoring Project Criteria, Sea Turtle Resuscitation Guidelines Project Criteria, and In-Water Line Precautions Project Criteria (Shell, 2026). Compliance with the regulations and applicable Project Criteria should negate or lessen the chance of significant impacts on sea turtles under this alternative.

**Noise**

The dominant source of noise from vessels is propeller operation, and the intensity of this noise is largely related to ship size and speed. Vessel noise from the proposed activities would produce low levels of noise, generally in the 150 to 170 dB re 1 µPa-m at frequencies below 1,000 Hz. Underwater radiated noise from vessels is transitory and generally does not propagate at great distances from the vessel. Vessel noise may impact sea turtle behavior, leading to temporary startle responses, altered submergence patterns, masking of biologically relevant sounds, and physiological stress (National Science Foundation 2011; Samuel et al. 2005). Sea turtles may exhibit a startle reaction, such as diving or swimming away, and temporary stress responses by increasing submergence time, extending dive durations, or surfacing (Lenhardt 1994; O'Hara and Wilcox 1990; Samuel 2004; Samuel et al. 2005). Hazel et al. (2007) found that sea turtles typically respond behaviorally to vessels at a distance of approximately 33 ft. (10 m) or closer. Current evidence indicates that sea turtles respond to vessel noise at very close ranges, making population-level impacts unlikely. While behavioral responses do occur, attributing them specifically to noise rather than visual or other cues remains challenging. Vessel noise generated by the Proposed Action would be localized and short-term. The most likely effects of vessel noise on sea turtles could include short-term behavioral changes and auditory masking.

There is very little information on the impacts of drilling and production noise on sea turtles. However, sea turtle hearing sensitivity is within the frequency range (100–1,000 Hz) of sound produced by low-frequency sources such as marine drilling (Popper et al. 2014). It is unlikely that sounds from drilling would reach injury thresholds, unless the sea turtle is within very close proximity to the drilling activity (Finneran et al. 2017; McCauley et al. 2000; Piniak et al. 2012), but it may cause temporary avoidance or displacement of sea turtles.

The dominant tones for aircraft noise, both airborne and underwater, are generally below 500 Hz (Richardson et al. 1995) and are within the auditory range of all sea turtles. Given the frequency range and sound levels produced, when aircraft travel at relatively low altitude, aircraft noise has the potential to elicit stress or behavioral responses in turtles (e.g., diving or swimming away or altered dive patterns) (BOEM 2016; National Science Foundation 2011). Sea turtle sensitivity to airborne noise is not well understood, and existing studies have yielded mixed results. Noise from helicopter overflights may elicit a startle response from sea turtles, and there is the possibility of short-term disruption of activity patterns and temporary sublethal stress (National Research Council 1990). Since helicopter noise would be temporary and pass within seconds, and given the relevant guidelines and regulations, sea turtles are not expected

to be adversely affected by routine helicopter traffic operating at prescribed required Federal Aviation Administration altitudes.

Sea turtles may exhibit some short-term avoidance behaviors, but their behavioral or physiological responses (e.g., stress) to noise associated with the Proposed Action are unlikely to have population-level impacts. Therefore, impacts to sea turtles from noise associated with the proposed activities are expected to be negligible.

### 3.3.3 Accidental Events

**Vessel Strike**

There is limited data available concerning potential sea turtle impacts from vessel strikes due to a lack of studies and/or the challenges with detecting such impacts (Nelms et al. 2016). Nonetheless, strikes from all types of vessels are known to result in sea turtle injury and mortality in the Gulf (Lutcavage et al. 1997; Nelms et al. 2016; Work et al. 2010). Sea turtles are vulnerable to vessel strikes due to the time they spend at the surface. Recent studies show that the time spent at the surface for basking, feeding, orientation, and mating is approximately 11 percent for loggerheads (Garrison et al. 2020), approximately 19 percent for greens (Roberts et al. 2022), and between 11 and 23 percent for Kemp's ridleys (Garrison et al. 2020), depending on the season. Serious injury, and/or minor, non-lethal injury can occur from vessel strike on a sea turtle, with the associated effects varying based on the size and speed of the vessel. There have been no documented sea turtle collisions with OCS oil- and gasrelated vessels in the Gulf; however, collisions with small or submerged sea turtles may go undetected. The operator will adhere to the Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Project Criteria, which prevents or minimizes the potential for vessel strikes by requiring the use of a visual observer (e.g., captain), vessel speed restrictions, and separation distances. Thus, effects on sea turtles from vessel strike are expected to be negligible but might be minor for undetected sea turtles underwater (e.g., vessel displacing water inadvertently moving sea turtles in wake).

**Marine Trash and Debris**

Marine debris, such as plastics, primarily affects sea turtles through entanglement and/or ingestion (e.g., choking or intestinal blockage) (Gall and Thompson 2015; Senko et al. 2020). Entanglement in marine debris could lead to injury, infection, reduced mobility, increased susceptibility to predation, decreased feeding ability, fitness consequences, and/or mortality (e.g., drowning) of sea turtles (Gall and Thompson 2015; Senko et al. 2020). Marine debris ingestion could lead to intestinal blockage, which can impact feeding ability and lead to injury or death (Gall and Thompson 2015; Senko et al. 2020). The discharge of marine debris by the offshore oil and gas industry and supporting activities is subject to several laws and treaties. The operator will adhere to the Marine Debris Project Criteria, which appreciably reduces the likelihood of sea turtles encountering marine debris from the proposed activity. Thus, effects on sea turtles from marine trash and debris are expected to be negligible.

**Oil/Chemical Spills and Oil-Spill Response**

Historical trends show that the frequency of oil spills has decreased substantially over the last two decades, and most spills are categorized as small (i.e., less than 1,000 bbl; ABS Consulting Inc. 2016; Anderson and LaBelle 1990; Anderson et al. 2012). Improvements in technology, industry practice, and regulations have contributed in part to decreased spill risk. Potential impacts of an oil spill depend on a variety of factors, such as spill magnitude, frequency, timing, location, and the meteorological and oceanographic conditions at the time (National Research Council 2003). Studies have shown that direct exposure of sensitive tissues (e.g., eyes, nares, and other mucous membranes) and soft tissues to oil may produce irritation and inflammation, and can adhere to turtle skin or shells (Lutcavage et al. 1995; Overton et al. 1983; Van Vleet and Pauly 1987). Sea turtles surfacing within or near an oil spill would be expected to inhale petroleum vapors, potentially causing respiratory stress. Ingested oil, particularly the lighter fractions, can be acutely toxic to sea turtles. Sea turtle eggs, hatchlings, and small juveniles are particularly vulnerable if contacted with oil (Fritts and McGehee 1982; Lutz and Lutcavage 1989). Sea turtle eggs laid on sandy beaches would likely be lethally impacted by contact with spilled oil (NPS 2010). The effects of contact with spilled oil on sea turtles could include mortality; decreased health, reproductive fitness, and longevity; as well as increased vulnerability to disease and contamination of prey species. Based on BOEM's review of the applicable scientifically credible information, the low potential for an oil spill to occur and contact a species due to applicable regulatory requirements (refer to **Chapter 1.5**), and considering the wide-ranging movements of sea turtles, the potential effects on sea turtles from oil/chemical spills are expected to be negligible to minor.

**Response Activities**

Response activities would be conducted on a case-by-case basis and only when deemed necessary. The removal methods used during any spill would be determined by the USCG's FOSC and representatives of the RRT or NRT. Spill response activities as outlined Shells 's approved regional OSRP could cause an increase in vessel traffic, and thus, an increased possibility for vessel strikes on sea turtles. Cleanup efforts in offshore waters may result in additional injury or mortality of sea turtles, particularly to neonates and juveniles. Due to the nature of the response activities, impacts could occur by a short-term behavioral change of sea turtles in the immediate affected area. Spill response impacts could include interrupted or deterred nesting behavior, crushed nests, entanglement in booms, and increased hatchling mortality due to predation from the increased time required to reach the water, assuming no outside intervention (Lutcavage et al. 1997). Increased human presence could influence turtle behavior and distribution, thereby stressing animals and making them more vulnerable to predators, the toxicological effects of oil, or other anthropogenic sources of mortality. Based on BOEM's review of the applicable scientifically credible information available, the low potential for an oil spill to contact species due to applicable regulatory requirements (refer to **Chapter 1.5**), and considering the wide-ranging movements of sea turtles, the potential effects on sea turtles from response activities are expected to be negligible to minor.

**Entanglement and Entrapment**

Entanglement, such as from lines in the water, and entrapment can result in stress, injury, or death of sea turtles (Gall and Thompson 2015; Senko et al. 2020). Sea turtles have become entrapped in dredge equipment (National Research Council 1990) and have the potential to become entrapped in any submerged structure that an individual is able to enter. Sea turtles can enter and surface within moon pools, potentially being entrapped. The operator will adhere to the In-Water Line Precaution Project Criteria (requiring lines in the water to be taut as required to prevent looping and tangling) and Moon Pool Monitoring Project Criteria, which appreciably reduce the likelihood of sea turtles being entangled or entrapped in gear from the proposed activity (Shell, 2026). With applicable Project Criteria, sea turtle entanglement in gear associated with the proposed activity, in addition to sea turtle entrapment in moon pools (though typically remains open to water if used), is unlikely to occur. Thus, because the possibility of entanglement and entrapment is low and since the operator must adhere to applicable Project Criteria, the effects on sea turtles are expected to be negligible.

**Conclusion**

Long-term or permanent displacement of sea turtles from preferred habitats and the destruction or adverse modification of any habitats are not expected to occur due to the scope, timing, and short-term nature of the proposed activities, and considering the wide-ranging movements and behaviors of sea turtles. Furthermore, application of the applicable Project Criteria, in addition to other relevant regulations, are expected to prevent or minimize potential effects to sea turtles from the above discussed IPFs. Based on the above analysis, BOEM finds that the potential effects from the Proposed Action on sea turtles are unlikely to rise to a level of significance.

## 3.4 AIR QUALITY

"Air Quality" refers to the degree to which the ambient air is free from pollution generated from various natural and anthropogenic air emission sources. The term "air emission" describes the gases and particles released by different sources, while "ambient air" is defined in 40 CFR 50.1(e) as the portion of the atmosphere outside of buildings that is accessible to the public. Air emissions associated with OCS oil- and gas-related activities on the OCS can influence ambient air pollutant levels in nearby coastal regions. For this analysis, these onshore areas include Texas, Louisiana, Mississippi, Alabama, and Florida. This area includes Breton Wilderness Area where air quality and air quality-related values (AQRVs) are protected.

Air quality is evaluated through several pollution indicators. For criteria air pollutants, **Table 3-4** identifies the areas currently designated as nonattainment under the National Ambient Air Quality Standards (NAAQS). The term "maintenance" area refers to an area that now meets the NAAQS but is still under an approved maintenance lan to ensure continued compliance.

Table 3-4. Nonattainment and Maintenance Areas on the U.S. Gulf Coast

| State | Area | 8-hr O3 (1997) | 8-hr O3 (2008) | SO2 (2010) | Lead (2008) |
|---|---|---|---|---|---|
| Alabama | Troy | – | – | – | NAA |
| Florida | Tampa | – | – | – | NAA |
| Florida | Hillsborough County | – | – | NAA | – |
| Florida | Nassau County | – | – | NAA | – |
| Louisiana | Baton Rouge | M | M | – | – |
| Louisiana | St. Bernard Parish | – | – | NAA | – |
| Texas | Beaumont-Port Arthur | M | – | – | – |
| Texas | Houston-Galveston-Brazoria | NAA | NAA | – | – |
| Texas | Frisco | – | – | – | NAA |

M = maintenance area; NAA = nonattainment area; O3 = ozone; SO2 = sulfur dioxide; – = the area is in attainment of the NAAQS.

Source: USEPA (2021).

### 3.4.1 Affected Environment

The proposed activities would occur approximately 67 mi (108 km) from the nearest shoreline, with air emission related operations located within surface lease block Mississippi Canyon Block 477. Air quality over Federal OCS waters is not classified under the NAAQS. In contrast, nearby coastal states contain areas classified as nonattainment or maintenance for one or more criteria air pollutants (**Table 3-4)**. All other onshore areas are in unclassifiable/attainment status. Sensitive areas, including the Breton Wilderness Area, may also be affected by transported emissions from the proposed activities.

Air quality conditions over the OCS are influenced by a wide range of emission sources. These include existing OCS oil and gas operations and associated support vessels; commercial marine traffic; and other anthropogenic and natural contributors identified in Chapter 4.1 of the 2025 PEIS. Pollutants emitted onshore can also be recirculated offshore under sea-breeze conditions and subsequently transported back to the coast.

Emissions form the Proposed Action constitute only a small fraction of total OCS-wide emissions. For the facilities in Mississippi Canyon Block 477, no prior plans have been approved. As a result, emissions associated with the Proposed Action represent 100 percent of the facility-specific emissions.

### 3.4.2 Impact Analysis

The IPFs associated with the proposed activities in Mississippi Canyon Block 477 that could impact the air quality include (1) air emissions emitted from routine activities (drilling and production related equipment, vessels, and flaring/venting), (2) air emissions emitted from accidental events such as oil/chemical spills, emergency flaring/venting, and response activities. An air quality analysis was conducted on the air emission estimates presented in the plan to

assess potential impacts to the air quality. For this SEA, impacts were evaluated and assigned levels of environmental impact caused by IPFs as listed below.

- **None** – The action has no effect.
- **Negligible** – No measurable impact(s). Impacts would be indistinguishable from localized existing conditions.
- **Minor** – a measurable negative impact on air quality that is likely distinguishable from localized existing conditions.
- **Moderate** – a notable and measurable negative impact on air quality that is likely distinguishable from localized existing conditions.
- **Major** – a notable and measurable negative impact on air quality, locally, with chronic effects that would not fully recover even after remedial action is taken.

**Table 3-5** lists the potential IPFs and associated impact levels for each alternative. Overall, routine and accidental impacts to air quality from the proposed activities are expected to be minor.

Table 3-5. Summary of Impact Levels for Air Quality

| Activity Initial | Impact-Producing Factor | Magnitude of Potential Impact Alternative 1 | Magnitude of Potential Impact Alternative 2 |
|---|---|---|---|
| Routine Activities (drilling, production, vessel support, and routine flaring and venting) | Air emissions and pollution | None | Minor |
| Accidental Events | Oil/Chemical Spills | None | Minor |
| Accidental Events | Response Activities | None | Minor |
| Accidental Events | Emergency Flaring and Venting | None | Minor |

A more detailed discussion of the IPFs and types of impacts to air quality that could occur from the proposed activities is included in Chapter 4.1 of the 2025 PEIS, from which this SEA tiers.

#### 3.4.2.1 Alternative 1

If selected, Alternative 1, No Action Alternative, would result in not undertaking the proposed activities as described in the plan. Therefore, the site-specific IPFs to air quality would not occur. Activities related to previously issued leases and permits, as well as those that may be issued in the future under separate decisions related to OCS oil- and gas-related activities, would continue. Under the No Action Alternative, the environmental impacts described in the 2025 PEIS for OCS oil- and gas-related activities would remain unchanged; however, any

previously approved activities would continue, and routine, accidental, and previously authorized activities and associated impacts could still occur.

#### 3.4.2.2 Alternative 2

If selected, Alternative 2, Proposed Action, would result in the operator undertaking the proposed activities. As described in the analyses below, the Proposed Action would have minor impacts on air quality. However, because the Houston-Galveston-Brazoria area is the nearest area listed in Table 3-4 to the Proposed Action and is currently designated as nonattainment for ozone ($O_3$), even a small contribution of ozone precursors warrants consideration given the area's nonattainment status.

### 3.4.3 Routine Activities

The calculated emission amounts for the proposed activities did not exceed any emission exemption amount per 30 CFR § 550.303(d). The estimated peak yearly emissions are shown in Table 3-6.

Table 3-6. Estimated Annual Emission Amounts in Tons per Year (tpy)

| | TSP | PM10 | PM2.5 | SOx | NOx | VOC | Pb | CO | $NH_3$ |
|---|---|---|---|---|---|---|---|---|---|
| Facility Amounts | 82.51 | 49.78 | 48.29 | 1.20 | 1978.25 | 56.87 | 0.01 | 310.62 | 0.58 |
| Support Vessel Amounts | 0 | 0 | 0 | 0 | 00 | 0 | 0 | 0 | 0 |

BOEM considered the cumulative impact of many plan approvals in Chapter 4.1 of the 2025 PEIS, from which this document tiers.

### 3.4.4 Accidental Events

**Emergency Flaring and Venting**

If an accidental or emergency flaring or venting of gas occurs, PM, $NO_x$, $SO_x$, CO, VOCs, and/or methane ($CH_4$) would be released to the atmosphere. These emissions can contribute to $O_3$ formation. Additionally, any flared and vented gas may contain $H_2S$ that may convert to $SO_2$. In general, emergency flaring and venting events are infrequent and of short duration. The emissions (PM, $NO_x$, $SO_x$, VOCs, $CH_4$, CO, and $SO_2$) are more abundant near the site and will disperse as it travels.

**Oil Spills**

If an oil spill occurs, VOCs from the surface oil slick will vaporize into the atmosphere. Increases in $O_3$ concentrations could occur because VOCs are precursors to $O_3$ formation. Additionally, if a fire occurs, PM and combustion product emissions will be emitted. In general,

accidental oil spill and gas release events are infrequent and are usually contained within a few days. The emissions (VOCs, PM, and combustible emissions) are more likely to be abundant near the site of the release and will disperse with distance. Given the proposed project's distance from the nearest shoreline, most air quality impacts would occur in offshore waters with minimal chance to affect onshore air quality.

**Response Activities**

Response activities may include scheduled burnings or dispersants to minimize potentially significant degradation to air quality from the release itself; however, response activities can also impact air quality through air emissions from equipment, vessels, aircraft, burning of gas and oil, and the application of dispersants via aircraft. The appropriateness of in-situ burn application would be determined in coordination with the FOSC and affected SOSC as outlined in the approved regional OSRP. Likewise, any proposed dispersant use must first be approved by the Region 6 response team, which includes BSEE and USEPA. In most cases, dispersant use is not approved within 3 miles of shore. See Shell's application for a detailed discussion of topics like release modeling, response technologies, and source containment, which were factored into this analysis.

**Conclusion**

The potential impacts of the projected emissions to the coastal areas are below all applicable thresholds; therefore, they are expected to be minor. Overall, routine and accidental impacts to air quality from the proposed activities are expected to be minor.

# 4 CONSULTATION AND COORDINATION

**Coastal Zone Management Act**

Per 15 CFR part 930 subpart D (private activities that require a Federal permit or license) and subpart E (OCS plans), proposed activities must be "fully consistent" with enforceable policies of a State's coastal management program. Consistency concurrence from the state of Louisiana must be received prior to plan approval.

**Endangered Species Act**

On March 31, 2026, the Endangered Species Committee held a meeting to address the Secretary of War's finding that it was necessary for reasons of national security to exempt Oil and Gas Activities from the requirements of the ESA. The Committee voted to exempt those activities under Section 7(j) of ESA. Pursuant to 16 U.S.C. §1536(j), post-lease oil and gas activities are exempt from the consultation requirements and take prohibitions of the ESA pursuant to an order issued by the Endangered Species Committee on March 31, 2026. The order outlined that BOEM and BSEE, through their OCSLA approvals, are to implement mitigation and monitoring measures that are already in place as project criteria. Those measures (i.e., Project Criteria) will be imposed as COAs.

**Marine Mammal Protection Act**

BOEM petitioned NMFS for rulemaking under the MMPA (16 U.S.C. §§ 1361 et seq.) relating to G&G surveys on the OCS in the Gulf. On January 19, 2021, NMFS published in the *Federal Register* a final Incidental Take Regulation (ITR), which became effective on April 19, 2021 (86 FR 5322). A draft revision to this regulation that corrects some calculation errors and therefore, adjusts taking allowable under the regulations was published on January 5, 2023 (88 FR 916). On April 24, 2024, NMFS published in the *Federal Register* its final rule, "Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Geophysical Surveys in the Gulf of Mexico" and the rule is effective from May 24, 2024, through April 19, 2026 (89 FR 31488). There are no changes to the specified activities or the specified geographical region in which those activities would be conducted, nor to the original 5-year period of effectiveness. A new request for MMPA authorization was prepared and submitted by industry on March 24, 2025. On September 3, 2025, NMFS' Office of Protected Resources received a request from the NMFS Office of Policy for the reimplementation of ITRs governing the incidental taking of marine mammals during G&G survey activity conducted in the Gulf (90 FR 42569). The proposed rule for reimplementing the ITRs was published on February 24, 2026 (91 FR 9014). On April 17, 2026, the reimplemented ITR was published (91 FR 20784) and is now in effect.

**Magnuson-Stevens Fishery Conservation and Management Act**

Pursuant to Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act, Federal agencies are required to consult with NMFS on any action that may

result in adverse effects to EFH. The NMFS published the final rule implementing the EFH provisions of the Magnuson-Stevens Fisheries Conservation and Management Act (50 CFR Part 600) on January 17, 2002. Certain OCS oil- and gas-related activities authorized by BOEM may result in adverse effects to EFH and therefore require EFH consultation. As such, BOEM prepared the *Essential Fish Habitat Assessment for the Gulf of Mexico* technical report on behalf of BOEM and BSEE; it describes the routine activities on the OCS, analyzes the effects of routine and accidental activities on EFH, and identifies mitigating measures (BOEM 2016). The 2017-2022 Programmatic EFH consultation with NMFS was concluded on September 14, 2017, with BOEM and BSEE concurrence with NMFS' conservation recommendations. The agreed upon conservation recommendations contain provisions for bottom-disturbing activities that would trigger an individual project-specific EFH consultation when they occur within specified distances of topographic features and live-bottom (Pinnacle Trend) features (refer to NTL 2009-G39).

**National Marine Sanctuaries Act**

Section 304(d) of the NMSA requires Federal agencies to consult with the Office of National Marine Sanctuaries (ONMS) whenever their proposed actions are likely to destroy, cause the loss of, or injure a sanctuary resource. BOEM and BSEE (the Bureaus), in discussion with the Flower Garden Banks National Marine Sanctuary (FGBNMS) and ONMS, determined that programmatic consultation is the most efficient and effective way to achieve agency obligations under Section 304(d) for a 10-year period of BOEM- and BSEE- authorized oil and gas activities expected to occur on the Gulf OCS. This programmatic consultation streamlines the Bureaus' subsequent permitting and approval processes by addressing reasonably foreseeable activities for the Federal oil and gas program in the Gulf that have the potential to injure FGBNMS resources. This programmatic consultation clarifies triggers for site-specific or activity-specific consultation.

**National Historic Preservation Act**

In accordance with the NHPA (54 U.S.C. §§ 300101 *et seq*.), Federal agencies are required to consider the effects of their undertakings on historic properties. The implementing regulations for Section 106 of the NHPA, issued by the Advisory Council on Historic Preservation (36 CFR Part 800), specify the required review process. In accordance with 36 CFR § 800.8(c), BOEM uses the NEPA substitution process and documentation to comply with Section 106 of the NHPA. Because of the extensive geographic area analyzed in the 2025 PEIS, BOEM defers identification of historic properties and completion of the Section 106 review process until site-specific analysis of postlease activities can be completed prior to approving those activities. Due to the site-specific analysis described in this SEA and additional mitigation measures, if applicable, BOEM has determined that no significant impacts to historic properties are likely to occur as a result of the Proposed Action.

**Clean Air Act**

The CAA Amendments of 1977 designated 156 Class I Areas, consisting of national parks and wilderness areas that are offered special protection for air quality and the AQRVs. Breton National Wildlife Refuge and Wilderness Area in Louisiana is a Class I Area. The Class I Areas, compared to the Class II Areas, have lower Prevention of Significant Deterioration (PSD) air quality increments that new sources may not exceed and are protected against excessive increases in several AQRVs, including visibility impairment, acid (sulfur and nitrogen) deposition, and nitrogen eutrophication. The Regional Haze Rule (40 CFR § 51.308) has a goal of natural visibility conditions by 2064 at Class I Areas, and States must submit Regional Haze Rule State Implementation Plans that demonstrate progress towards that goal.

**Clean Water Act**

The USEPA (Regions 4 and 6) regulates the discharge of routine operational waste streams generated from offshore oil- and gas-related activities. Section 403 of the CWA requires that NPDES permits be issued for discharges to State territorial waters, the contiguous zone, and the ocean in compliance with the USEPA's regulations for preventing unreasonable degradation of the receiving waters. There are two general NPDES permits that cover the oi- and gas- related discharges on the OCS. Permit GMG290000, issued by USEPA Region 6, covers the WPA and CPA; Permit GEG460000, issued by USEPA Region 4, covers the EPA and a small part of the CPA.

The final NPDES General Permit No. GMG290000 for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category for the Western and Central Portion of the Outer Continental Shelf of the Gulf of Mexico was reissued by USEPA Region 6 on May 11, 2023, with an effective date of May 11, 2023, and an expiration date of May 10, 2028 (USEPA 2023).

**Government-to-Government Tribal Consultation**

In accordance with Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments," Federal agencies are required to establish regular and meaningful consultation and collaboration with Tribal officials in the development of Federal policies that have Tribal implications to strengthen the United States' government-to-government relationships with Indian Tribes and to reduce the imposition of unfunded mandates upon Indian Tribes.

BOEM has formally invited Tribal Nations with current or ancestral ties to the region to consult on the development of OCS oil- and gas-related activities, including the 2025 PEIS. Tribes that BOEM has invited to consult on these activities include the Alabama-Coushatta Tribe of Texas, Caddo Nation of Oklahoma, Chitimacha Tribe of Louisiana, Choctaw Nation of Oklahoma, Coushatta Tribe of Louisiana, Jena Band of Choctaw Indians, Miccosukee Tribe of Indians of Florida, Mississippi Band of Choctaw Indians, Muscogee (Creek) Nation, Poarch Band

of Creek Indians, Seminole Tribe of Florida, Seminole Nation of Oklahoma, and Tunica-Biloxi Indian Tribe of Louisiana.

No tribes have accepted invitations for government-to-government consultation on these activities; however, tribal representatives have requested to be notified if any pre-contact archaeological resources are identified and/or adversely impacted by BOEM-permitted activities. To date, no such discoveries or adverse impacts have occurred. Were they to occur during activities associated with the proposed plan, BOEM will notify and invite consultations with the above tribes as requested.

**Greenhouse Gas Analysis**

BOEM produced the technical report Gulf of Mexico OCS Oil and Gas Leasing Greenhouse Gas Emissions and Social Cost Analysis (2022 GOM GHG Analysis), which summarizes the life cycle greenhouse gas (GHG) emissions estimated to result from a typical conventional energy lease sale (BOEM 2022). The report is included as a reference for ongoing site-specific environmental reviews, including those associated with plan reviews. The analysis encompasses emissions potentially resulting from the full life cycle of oil and gas exploration, development, production, and consumption from a representative lease sale; it also estimates emissions from use of energy substitutes in the absence of that leasing.

BOEM acknowledges that the models used in those analyses were developed for programmatic analysis applied at a regional level and there may be limitations on the scalability of the models from this analysis to the site-specific review here. The programmatic analysis depends on a global price change, and individual site-specific decisions may not cause large enough changes in production to generate a market response for substitute energy sources. The site-specific analysis represents a small subset of the activities analyzed for the 2022 GOM GHG Analysis. BOEM has reviewed that analysis and determined that it provides the best available information and that the reasonably foreseeable impacts of the activities proposed in Initial EP N-10269 are not likely to result in significant impacts beyond a subset of those analyzed in the 2022 GOM GHG Analysis.

**U.S. Government Accountability Office**

In February 2016, the U.S. Government Accountability Office (GAO) prepared a report entitled “Oil and Gas Management: Interior’s Bureau of Safety and Environmental Enforcement Restructuring Has Not Addressed Long-Standing Oversight Deficiencies” (GAO 2016). This report examined the extent to which BSEE’s restructuring at the time had an effect on its capabilities for (1) investigations, (2) environmental compliance, and (3) enforcement. The GAO reviewed laws, regulations, and policies related to BSEE’s restructuring and oversight activities. In the report, the GAO had nine recommendations, including that BSEE (1) complete and update its investigative policies and procedures, (2) conduct and document a risk analysis of the regional-based reporting structure, and (3) develop procedures for enforcement actions. BSEE began addressing the recommendations in 2016 and according to GAO, as of 2021, all

recommendations related to BSEE's restructuring and offshore oil and gas oversight have been closed and implemented (GAO 2021). The GAO removed the segment from its High Risk Series in 2021. After independently reviewing the GAO reports and the updates on the GAO website closing out the recommendations on oversight and restructuring, BOEM has determined that the GAO report and the recommendations that have now been implemented by BSEE do not change the reasonably foreseeable environmental impacts that may result from an oil and gas lease sale. BOEM has also determined the GAO report or implementation of the recommendations does not affect BOEM's conclusions regarding impacts reasonably foreseeable from the proposed activities (i.e., will not result in significant impacts) as related to this site-specific review.

# 5 PUBLIC COMMENT

Shell's N-10269 EP was deemed submitted (as per 30 CFR § 550.231) on April 13, 2026, and it was placed on regulations.gov for a 10-day public review. At the end of the comment period on April 23, 2026, no public comments were received.

## APPENDICES

# A. IMPACT-PRODUCING FACTOR DESCRIPTIONS

Descriptions of the impact-producing factors (IPFs) are provided below. The information provided below are summaries of the information included in the main text of this SEA. Additional detailed information can also be found in the 2025 PEIS.

### Routine Activities

(1) **Bottom disturbance** from well and anchor emplacement and drilling activities – Physical disturbance to the seabed, benthic habitats, and/or communities. Typically, wells drilled in shallow water (0–300 m [0–984 ft]) create a splay of drilling muds and cuttings that spread 250 m (820 ft) from the well, and the coverage area would be approximately 500 m (1,640 ft) from the well in deepwater (300 to 1,524 m [984 to 5,000 ft]) and ultra deepwater (greater than 1,524 m [5,000 ft]) water depths.

(2) **Noise** from drilling activities and vessel and helicopter transportation – A subjective term reflective of societal values regarding what constitutes unwanted or undesirable intrusions of sound. Noise generated from these activities can be transmitted through both air and water, and may be of long or short duration, distance, and sound level. The intensity level and frequency of the noise emissions are highly variable, both between and among the various types of sound sources, along with the received sound levels to the resources. The primary sources of vessel noise are propeller cavitation, propeller singing, and rotating machinery; other sources include auxiliaries, flow noise from water dragging along the hull, and bubbles breaking in the wake (Richardson et al., 1995)[9]. Drilling operations (these can include pile driving, generators, pumps, etc.) often produce noise that includes strong tonal components at low frequencies, including infrasonic frequencies in at least some cases[10].

(3) **Discharges and Wastes** from vessel operations and exploration activities – Releases into the environment resulting from multiple sources. The primary operational wastes and discharges generated during offshore oil and gas exploration and

[9] The intensity of noise from service vessels is roughly related to ship size, laden or not, and speed. Large ships tend to be noisier than small ones, and ships underway with a full load (or towing or pushing a load) produce more noise than empty vessels. For example, a 16-m (52-ft) crewboat may have a 90-hertz (Hz) tone with a source level of 156 dB re: 1µPa, and a small ship may have a broadband source level of 170-180 dB re: 1µPa (Richardson et al., 1995). Helicopter sounds contain dominant tones (resulting from rotors) generally below 500 Hz (Richardson et al., 1995).

[10] Dynamically positioned MODUs (drillships and semisubmersibles) are noisier than anchored MODUs (Richardson et al., 1995). Sound and vibration paths to the water are through either the air or the risers, in contrast to the direct paths through the hull of a drillship. Sound from drilling activities has been measured from the 20- to 1,000-Hz band levels at a range of 1.8 km (1.1 mi) at levels of 113–126 dB re: 1µPa.

development are drilling fluids, drill cuttings, various waters (e.g., bilge, ballast, fire, and cooling), deck drainage, sanitary wastes, and domestic wastes. During production activities, additional waste streams include produced water, produced sand, and well-treatment, workover, and completion fluids. Minor additional discharges occur from numerous sources. These discharges may include desalination unit discharges, blowout preventer fluids, boiler blowdown discharges, excess cement slurry, several fluids used in subsea production, and uncontaminated freshwater and saltwater.

(4) **Space Use Conflicts** – Wells, platforms, pipelines, subsea infrastructure, and other structures create obstructions to the recovery of marine minerals and other existing or future users (commercial and recreational fishing, aquaculture, renewable, artificial reefs, etc.) of the OCS. BOEM is required to consider the impact of the proposed activities on other users of the OCS. For marine minerals, no-dredging zones are 500 ft (152 m) from any structure and 1,000 ft (305 m) from a pipeline. The well and platforms would be permanent obstructions, even if removed to 15 ft (5 m) below the substrate, as dredging cannot be performed within 500 ft (152 m) due to the risk to the dredge and infrastructure. The pipeline obstruction could be temporary in that pipelines can be removed upon abandonment. All military activities on the OCS occur within military warning areas designated by the Federal Aviation Administration in coordination with the U.S. Department of Defense. Lessees and permittees conducting oil and gas operations within these warning areas are required to coordinate with the appropriate military command.

(5) **Air Emissions** from equipment and vessels – Emissions associated with drilling from OCS oil- and gas-related activities are attributed to gasoline, diesel, and natural gas fuel usage in engines such as propulsion engines, prime engines, mud pumps, draw works, and emergency power. Emissions associated with production from OCS oil- and gas-related activities are attributed to boilers, diesel engines, combustion flares, fugitives, glycol dehydrators, natural gas engines, turbines, pneumatic pumps, pressure/level controllers, storage tanks, cold vents, and others. Pollutants emitted during drilling activities include combustion gases (i.e., CO, $NO_x$, PM, $SO_2$, $CO_2$, $CH_4$, and $N_2O$), as well as non-combustion sources (i.e., VOCs, PM, and $CH_4$)[11].

**Accidental events**

(1) **Oil/Chemical Spills** (loss of well control and chemical/drilling fluid) **and Oil-Spill Response** – BSEE requires operators to report any spill greater than 1 barrel (bbl)

[11] CO – carbon monoxide; $NO_x$ – nitrogen oxide; PM – particulate matter; $SO_2$ – sulfur dioxide; $CO_2$ – carbon dioxide; $CH_4$ – methane; $N_2O$ – nitrous oxide; and VOC – volatile organic compound.

(42 gallons [gal]) occurring on the OCS and maintains a database for all reported incidents[12]. All losses of well control are required to be reported to BSEE.

### *Loss of Well Control*

The current definition for loss of well control is as follows:

- uncontrolled flow of formation or other fluids (the flow may be to an exposed formation [an underground blowout] or at the surface [a surface blowout]),
- uncontrolled flow through a diverter, and/or
- uncontrolled flow resulting from a failure of surface equipment or procedures.

Not all loss of well control events would result in a blowout as defined above, but they are most commonly thought of as releases to the human environment. A loss of well control can occur during any phase of development, i.e., exploratory drilling, development drilling, well completion, production, or workover operations. A loss of well control can occur when improperly balanced well pressure results in sudden, uncontrolled releases of fluids from a wellhead or wellbore (Neal Adams Firefighters Inc. 1991; PCCI Marine and Environmental Engineering 1999).

The physical and chemical properties of oil greatly affect its transport and fate in the environment. Following a spill, the composition of the released oil can change substantially due to weathering processes such as evaporation, emulsification, dissolution, and oxidation. The ultimate fate of oil in the environment and its impacts are influenced not only by the magnitude, spatial extent, and duration of the event but also by the response methods that may be employed. Horizontal transport of oil is accomplished through spreading, advection, dispersion, and entrainment. Vertical transport involves dispersion, entrainment, Langmuir circulation (a series of shallow, slow, counter-rotating vortices at the ocean's surface aligned with the wind developed when wind blows steadily over the sea surface), sinking, overwashing, partitioning, and sedimentation.

### *Chemical and Drilling Fluid Spills*

Chemicals and synthetic-based drilling fluids are considered because they may be persistent (nondegradable) and are comparatively toxic. A study of chemical spills from OCS oil and gas activities determined that only two chemicals could potentially impact the marine environment

[12] Not included in BSEE's data records are spills less than 1 bbl. Spills of any size and composition are required to be reported to the U.S. Coast Guard's (USCG) National Response Center and are further documented in the USCG's Marine Information for Safety and Law Enforcement (2001-present) database and its predecessors. Also not included in BSEE's database are spills that have occurred in Federal waters from OCS barging operations and from other service vessels that support the OCS oil and gas industry. These data are included in the USCG's record of all spills; however, the USCG's database does not include the source of oil (OCS versus non-OCS) or in the case of spills from vessels, the type of vessel operations; such information is needed to determine if a particular spill occurred as a result of OCS operations. Spills from vessels are provided for tankers in worldwide waters and tankers and barges in U.S. coastal and offshore waters.

– zinc bromide and ammonium chloride (Boehm et al. 2001). Other common chemicals spilled include methanol and ethylene glycol, which are used in deepwater and ultra deepwater operations where gas hydrates tend to form due to cold temperatures. These alcohol-based chemicals are nonpersistent (degradable) and exhibit comparatively low toxicity.

(1) **Air emissions** from emergency flaring/venting and/or oil spills – Activities that produce emissions include drilling operations, platform construction and emplacement, platform operations, flaring, fugitive emissions, evaporation of volatile organic compounds during transfers and spills, and support vessel emissions. Various onshore facility activities supporting offshore oil and gas operations, or receiving oil or gas from them, emit air pollutants. This includes emissions from helicopters, vessels, stationary engines (e.g., generators), and equipment leaks (i.e., fugitive emissions). The USEPA defined criteria pollutants released by OCS sources include CO, $NO_2$, $PM_{10}$, $PM_{2.5}$ and $SO_2$.

(2) **Vessel Strike (Vessel to Marine Species or Habitat) and Collisions (Vessel to Vessel; Vessel to Structure)** – BOEM's data show that, from 2007 through 2019, there were 181 OCS oil- and gas-related vessel collisions (BSEE 2021). Most collision mishaps are the result of service vessels colliding with platforms or vessel collisions with pipeline risers. Fires resulted from hydrocarbon releases in several of the collision incidents. Diesel fuel is the product most frequently spilled, while oil, natural gas, corrosion inhibitor, hydraulic fluid, and lube oil have also been released as the result of a vessel collision. Approximately 10 percent of vessel collisions with platforms in the OCS caused diesel spills.

Vessels could strike marine mammals, sea turtles, and other marine animals during transit. To limit or prevent such strikes, the National Marine Fisheries Service (NMFS) provides all boat operators with whale-watching guidelines, which is derived from the Marine Mammal Protection Act (MMPA). These guidelines suggest safe navigational practices based on speed and distance limitations when encountering marine mammals. Requirements in the Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Project Criteria address vessel strike prevention.

(3) **Marine Trash and Debris** – During construction or operation activities, equipment may be dropped to the seafloor. If this happens within the planned construction site, the bottom disturbance impacts are conservatively considered as part of the routine impacts; however, accidental drops may occur during transport. The discharge of marine debris by the offshore oil and gas industry and supporting activities is subject to a number of laws and treaties. These include the Marine Debris Research, Prevention, and Reduction Act; the Marine Plastic Pollution Research and Control Act; and the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex V Prevention of Pollution by Garbage from Ships. Regulation and enforcement of these laws is conducted by a number of agencies such as the U.S. Environmental Protection Agency (USEPA), National

Oceanic and Atmospheric Administration (NOAA), and U.S. Coast Guard (USCG). Requirements in the Marine Debris Project Criteria address marine debris prevention.

(4) **Entanglement/Entrapment** – Marine animals may become entangled or entraped in facility (platform) or vessel moon pool, flexible lines, equipment, or gear used during construction, drilling, production/operation, and decommissioning activities. Lines in the water, moon pools, or accidental marine debris may pose an entanglement/entrapment risk. Entanglement and entrapment can lead to injury, infection, reduced mobility, increased susceptibility to predations, decreased feeding ability, fitness consequences (increased potential for vessel strike due to an inability to avoid), and/or mortality of marine wildlife. Requirements in the In-Water Line Precaution Project Criteria and the Moon Pool Monitoring Project Criteria address entanglement/entrapment prevention.

# Protected Species Project Criteria for the Oil and Gas Program in the Gulf of America

April 2026

# Contents

# Attachment 1: The Bureaus' Geophysical Survey Project Criteria

## A.1 OPERATIONAL NATIONAL PROJECT CRITERIA FOR GEOPHYSICAL SURVEYS[1]

**Table 1. Summary of Tiers and Associated Project Criteria**

| Elements | Tier 1 | Tier 2 | Tier 3[2] | Tier 4 |
|---|---|---|---|---|
| Sources | Airgun arrays > 1,500 $in^3$ or any array with > 12 airguns | Airgun arrays ≤ 1,500 $in^3$ or ≤ 12 airguns | Sparkers | *De minimis* sources (see below) |
| Visual Protected Species Observers (PSO)[3] | Minimum of 2 NMFS-approved PSOs on duty during daylight hours (30 minutes before sunrise through 30 minutes after sunset); Limit of 4 consecutive hours on watch followed by a break of at least 1 hour; Maximum of 12 hours on watch per 24-hour period | Minimum of 2 NMFS-approved PSOs on duty during daylight hours (30 minutes before sunrise through 30 minutes after sunset); Limit of 4 consecutive hours on watch followed by a break of at least 1 hour; Maximum of 12 hours on watch per 24-hour period | Minimum of 1 PSO on duty during daylight hours (30 minutes before sunrise through 30 minutes after sunset); PSOs must be either designated by the Federal agency funding/conducting the survey or approved by NMFS | Not required |
| Passive acoustic monitoring (PAM) | Required[4]; minimum of 1 NMFS-approved PAM operator on duty from 30 minutes before start of source to 1 hour past the end of source use; Limit of 4 consecutive hours on watch followed by a break of at least 1 hour; Maximum of 12 hours on watch per 24-hour period | Not required | | |
| Shutdown zones | • 500 m (all marine mammals)<br>• 1,500 m (special circumstances; see Table 2 below)<br>• 150 m (sea turtles) | • 100 m (all marine mammals and sea turtles)<br>• 500 m (special circumstances; see Table 2 below) | | Not required |

[1] Agencies responsible for the preparation of these protocols include NOAA's NMFS, BOEM, and BSEE. The DOI's U.S. Geological Survey and the National Science Foundation provided input. Requirements for notifications, reporting, etc. to BOEM and/or BSEE are limited to activities occurring pursuant to those agencies' relevant statutory and regulatory authorities.

[2] A MMPA incidental take authorization is not required for Tier 3 surveys implementing these protocols.

[3] 24-hr visual monitoring may be required as warranted by improvements in low-light detection capabilities.

[4] PAM is not required for Tier 1 surveys occurring in Cook Inlet or in water depths < 100 m in the Gulf of America. Borehole seismic surveys (also referred to as vertical seismic profiles [VSP]) involving use of a stationary source position that is close to the well (e.g., deployed from a platform), such as zero-offset VSPs, are not required to use PAM.

| Elements | Tier 1 | Tier 2 | Tier 3[2] | Tier 4 |
|---|---|---|---|---|
| Pre-start clearance (additional buffer zone as applicable) | Required; 30-minute clearance period of the following zones:<br>• 1,000 m (all marine mammals)<br>• 1,500 m (special circumstances; see Table 2 below)<br>• 150 m (sea turtles)<br>Following detection within zone, animal must be observed exiting or additional period of 15 or 30 minutes | Required; 30-minute clearance period of the following zones:<br>• 200 m (all marine mammals)<br>• 100 m (sea turtles)<br>• 500 m (special circumstances; see Table 2 below)<br>Following detection within zone, animal must be observed exiting or additional period of 15 or 30 minutes | Required; 30-minute clearance period of the following zones:<br>• 100 m (all marine mammals and sea turtles)<br>• 500 m (special circumstances; see Table 2 below)<br>Following detection within zone, animal must be observed exiting or additional period of 15 or 30 minutes | Not required |
| Ramp-up | Required; duration ≥ 20 minutes | Required for arrays only; duration dependent on number of elements; no minimum duration required | Required when technically feasible; ramp up sources to half power for 5 minutes and then to full power | Not required |
| Shutdown | Shutdown required for marine mammal detected within defined shutdown zones; Shutdown (i.e., pause) not requiring ramp -up for sea turtles detected within defined shutdown zones (during Tier 3 surveys, shutdown [i.e., pause] for sea turtles is optional); Exception for certain delphinids and pinnipeds; Re-start allowed following clearance period of 15 or 30 minutes. | | | Not required |

### A.1.1 Background

The use of marine acoustic sources for acquiring geophysical data (geophysical surveys) may have an impact on marine life, including marine mammals (all of which are protected under the Marine Mammal Protection Act [MMPA]) and species listed under the ESA. In addition, the Outer Continental Shelf Lands Act (OCSLA) requires that geophysical survey data be obtained in an environmentally sound manner. Due to these legal and environmental concerns, protocols were developed to mitigate the impacts of these sources on sensitive species and habitats and have become part of the project criteria for BOEM's approvals. The BOEM/BSEE proposed action under the 2025 NMFS BiOp includes robust avoidance or minimization measures (i.e., protocols), and those measures will continue to be implemented in the Gulf of America as project criteria under the 2026 Endangered Species Committee Order, as well as pursuant to the Bureaus authority under OCSLA (43 U.S.C. §§ 1331 et seq.).

These protocols were included as part of the proposed action in the 2025 NMFS BiOp;[5] reflect past and current requirements and are based on measures identified through the following: review of mitigation protocols required or recommended elsewhere and implemented pursuant to BOEM and BSEE's authority under OCSLA; review of articles and other available scientific literature; project design criteria, terms and conditions, and reasonable and prudent measures identified in ESA section 7 consultations; mitigation, monitoring, and reporting requirements identified in previous MMPA Incidental Take Authorizations (ITAs) issued to survey operators;

[5] These protocols are designed for use in conjunction with activities for which take is authorized and/or exempted under the MMPA and/or ESA (Tiers 1/2) or may be used to avoid the potential for take or otherwise reduce impacts to species (Tier 3). "Take" is defined under the respective statutes.

and NMFS' technical memorandum on standards for a protected species observer and data management program (Baker et al., 2013).

To protect marine mammals and ESA-listed species (hereafter referred to as protected species) during operations, operators are required to follow specific survey protocols. Here, we address standardized baseline operational mitigation and monitoring protocols. However, it is important to be clear that different and/or additional protocols may sometimes be required depending on the specific action, location, and/or circumstances.[6] For example, time/area restrictions (which are not discussed here) may be required where sensitive species or stocks and/or critical biological functions are known to occur, or where subsistence uses are occurring.

Compliance with these standard operational requirements must be demonstrated by submitting reports as detailed below in the Reporting section (A.1.10).

Geophysical surveys are conducted to acquire information on marine seabed and subsurface geology, seafloor bathymetry, and water column features. The purposes of geophysical surveys include, but are not limited to: (1) obtaining data for hydrocarbon and mineral exploration and production; (2) siting of oil and gas structures, facilities, and pipelines and renewable energy structures and cables; (3) identifying possible seafloor or shallow-depth geologic hazards; (4) locating archaeological resources and benthic habitats; (5) mapping seafloor bathymetry and structure; and (5) conducting academic or government research. A general hierarchy of protocols is presented for three different categories of activities: Tier 1, Tier 2, and Tier 3. De minimis sources are included in a Tier 4, with no required mitigation protocols.

### A.1.2 Tier Summary

**Tier 1**: Airgun arrays with total volume greater than 1,500 $in^3$ or any array with more than 12 airguns

**Tier 2**: Airgun arrays with total volume less than or equal to 1,500 $in^3$ and 12 airguns or fewer; single airgun

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[6] We note that for any MMPA authorization issued, measures ensuring the "least practicable adverse impact" must be included, and that this standard applies to both marine mammal species or stocks and their habitat, as well as subsistence uses. This means that while a standardized list of measures will be helpful by increasing efficiency and effectiveness, NMFS still must independently evaluate every application, and there may occasionally be circumstances wherein the appropriate application of the "least practicable adverse impact" standard necessitates either the inclusion of additional measures or the shutdown of otherwise standard measures. Likewise, each ESA section 7 consultation requires analysis of the specific action proposed by the action agency. Protocols considered part of the proposed action are referred to as conservation measures in ESA consultations and the extent to which they avoid or minimize the effects of the action on ESA-listed species and/or designated critical habitat is analyzed as part of the consultation. Formal ESA section 7 consultations require NMFS issue a Biological Opinion with an associated Incidental Take Statement (ITS) that includes Reasonable and Prudent Measures (RPMs) considered necessary or appropriate to minimize the impact of any incidental take of ESA-listed species. Terms and Conditions (T&C) to implement the RPMs are included in the ITS. The RPMs and associated T&Cs may require additional measures to minimize take of ESA- listed species. There may also be cases where NMFS determines the measures described in this document and included in conservation measures that are part of the proposed action require modification or are not sufficiently protective as to avoid or minimize the effects of the action on ESA-listed species and/or designated critical habitat. Consistent with the 2026 order issued by the Endangered Species Committee, BOEM and BSEE are implementing the proposed action from the ESA consultations for oil and gas activities in the Gulf of America, as well as mitigations required by the Bureaus through authorities under other laws such as OCSLA.

**Tier 3**: Sparkers

**Tier 4**: *De minimis* sources.

Examples of *de minimis* sources:

- Multibeam echosounders (hull-mounted or portable)
- Side-scan and sector-scanning sonars
- Hull-mounted non-parametric sub-bottom profilers (SBPs) (e.g., Knudsens)
- Parametric shallow penetration SBPs (e.g., Innomars)
- Fathometers for navigation
- Towed non-parametric SBPs/ Compressed High-intensity Radiated Pulse (Chirp) systems (e.g., Edgetech 424, Edgetech 512i)
- EK60/EK80 split-beam echosounders
- 3-plate boomers
- Pingers (acoustic locators) for locating over the side wireline instrumentation in the water column
- Acoustic releases (brief duration pinging), e.g., for moorings, landers, OBS
- Ultra-short baseline (USBL) and long baseline (LBL) positioning equipment, e.g., for navigation of submersibles, remotely operated vehicles (ROVs), etc.
- All Acoustic Doppler Current Profiling (ADCP) equipment
- All instrumentation on human occupied vehicle (HOV)/ autonomous underwater vehicle (AUV)/ROVs
- Pressure-equipped inverted echo sounders (PIES) and Pressure Monitoring Transducers (PMTs)
- Electromagnetic sources
- Wolfspar[7]
- All instruments operated at 180 kHz or greater

Any additional sources that have the similar source level/directivity/frequency characteristics as those already included here may be included in Tier 4.

### A.1.3 Definitions

Terms used in these protocols have the following meanings:

1. Protected species means any NMFS trust species listed under the ESA and/or protected by the MMPA. The requirements discussed herein primarily focus on air-breathing protected species that are more readily observed at the surface, such as marine mammals and sea turtles. However, other ESA-listed species are also protected, and observations of these species should be reported as detailed below.
2. Protected Species Observer (PSO) means a trained, independent biologist employed for purposes of conducting visual and/or acoustic observation for protected species. A conditionally-approved PSO is one with limited geophysical survey experience (i.e., less than 90 days tier-specific at-sea duty time under a lead PSO). An unconditionally-

[7] Wolfspar is a proprietary low-frequency source used to supplement the quantity and quality of data collected during surveys using conventional airgun sources. Wolfspar is a variable-frequency marine resonator designed to produce ultra-low frequency (from 1.4-16 Hz, but typically used to produce signals at 2-4 Hz) swept (non-impulsive) signals. Other alternative low-frequency sources may be evaluated on a case-by-case basis.

approved PSO is one with more than 90 days tier-specific at-sea experience (but no more than 18 months elapsed since the conclusion of the at-sea experience).

3. An Incidental Take Authorization (ITA), issued pursuant to the MMPA, authorizes the take of marine mammals incidental to a specified activity. An ITA may be either an incidental harassment authorization (IHA), which is effective for a maximum period of one year, or a letter of authorization (LOA), which is issued under incidental take regulations (ITR) and may be effective for a period of up to five years.
4. An Incidental Take Statement (ITS) is provided with a biological opinion, in cases where NMFS concludes that a proposed agency action is found to be consistent with section 7(a)(2) and the proposed action may incidentally take ESA-listed species. The ITS specifies the impact of any incidental taking of listed species. To minimize such impacts, Reasonable and Prudent Measures (RPMs) and Terms and Conditions to implement the RPMs must be provided. Section 7(b)(4)(C) of the ESA provides that take of ESA-listed marine mammals may be included in the ITS of a biological opinion only if the taking is authorized through an MMPA ITA. Consistent with the 2026 Endangered Species Committee order, BOEM and BSEE are exempted from the take prohibitions and limitations under the ESA in the Gulf of America, but must still comply with mitigations, protocols and reporting pursuant to the order and the Bureaus' requirements issued under their authority under OCSLA.
5. Tier 1 surveys are those using an airgun array with a total volume of greater than 1,500 $in^3$, or those containing more than 12 airguns, as the acoustic source. These surveys are also referred to as deep penetration or high energy surveys.
6. Tier 2 surveys are those using an airgun array with total volume of 1,500 $in^3$ or less, with 12 or fewer airguns, or a single airgun as the acoustic source. These surveys are also referred to as shallow penetration or low energy surveys.
7. Tier 3 surveys are those using a sparker.
8. "De minimis" here refers to sources considered unlikely to result in the incidental take of protected species. No mitigation protocols are required during surveys using only *de minimis*, or Tier 4, sources. Generally, use of these sources may be considered as not likely to adversely affect ESA-listed species and would not result in incidental take of marine mammals (as defined under the MMPA).
9. The term "small odontocetes" is used herein to define a group of cetacean species for purposes of defining the appropriate pre-start clearance period. Small odontocetes, as defined here, include certain genera of the Family Delphinidae (*Delphinus*, *Lagenodelphis*, *Lagenorhynchus*, *Lissodelphis*, *Stenella*, *Steno*, and *Tursiops*) and members of the Family Phocoenidae (i.e., porpoises). Note that the use of the term "small" in this context is not an absolute reference to size, but is rather used as reference to a group of species that are not typically deep diving.
10. The term "small delphinid" is used herein to define a group of cetacean species for which shutdown requirements are waived. Small delphinids, as defined here, include the same genera of the Family Delphinidae as are included in the definition of the term "small odontocete" above.
11. Pre-start clearance refers to a period of monitoring that may be required in order to ensure that protected species are not present within defined zones prior to activation of the sound source.
12. Ramp-up means the gradual and systematic increase of emitted sound levels from an active acoustic source.
13. Shutdown of the acoustic source means the immediate de-activation of the source, including all individual airgun elements of an array.
14. Shutdown zone (formerly exclusion zone) means the area to be monitored for possible shutdown upon detection of protected species within or entering that zone.

15. Buffer zone means a focal area beyond the standard shutdown zone to be monitored for the presence of protected species.
16. Visual monitoring means the use of trained PSOs (visual PSOs) to systematically scan the ocean surface visually for the presence of protected species and implement the required mitigation procedures. These PSOs must have successfully completed a PSO training program as described below. The focal area for visual observation includes the shutdown zone and buffer zone (when required), but PSOs should periodically scan adjacent waters. Visual monitoring of the shutdown zones and adjacent waters is intended to establish and, when visual conditions allow, maintain zones around the sound source that are clear of protected species. Visual monitoring of the buffer zone (when required) is intended to (1) provide additional protection to protected species that may be in the area during pre-start clearance, (2) aid in establishing and maintaining the shutdown zone by alerting the PSOs and crew of protected species that are outside of, but may approach and enter, the shutdown zone, and (3) enable collection of additional monitoring data to support an understanding of the effects of the activity on protected species.
17. Acoustic monitoring means the use of trained PSOs (acoustic PSOs[8]) to operate PAM equipment to acoustically detect the presence of vocalizing marine mammals. These observers must have successfully completed an acoustic PSO (or PAM operator) training program as described below. Acoustic monitoring involves acoustically detecting vocalizing marine mammals regardless of distance from the source, as localization of animals may not always be possible. Acoustic monitoring is intended to further support visual monitoring in maintaining a shutdown zone around the sound source. In cases where visual monitoring is not effective (e.g., due to weather, nighttime), acoustic monitoring may be used to allow certain activities to occur (or continue), as further detailed below.

### A.1.4 General Requirements (Tiers 1–3)

1. A copy of any issued BOEM permit (if applicable) and/or ITA (if required) must be in the possession of the holder, vessel operator, other relevant personnel, the lead PSO (see description below), and any other relevant designees operating under the authority of the permit and/or ITA.
2. The operator must instruct relevant vessel personnel with regard to the authority of the protected species monitoring team, and must ensure that relevant vessel personnel and the protected species monitoring team participate in a joint onboard briefing (hereafter PSO briefing), led by the vessel operator and lead PSO, prior to beginning work to ensure that responsibilities, communication procedures, protected species monitoring protocols, safety and operational procedures, and permit/ITA requirements are clearly understood. This PSO briefing must be repeated when relevant new personnel (e.g., PSOs, acoustic source operator) join the survey operations before work commences.
3. The acoustic source must be deactivated when not acquiring data or preparing to acquire data, except as necessary for testing. Unnecessary use of the acoustic source must be avoided. For use of airgun arrays, notified operational capacity (not including redundant backup airguns) must not be exceeded during the survey, except where unavoidable for source testing and calibration purposes. All occasions where activated volume exceeds

[8] Acoustic PSOs may be referred to as PAM operators.

notified operational capacity must be communicated to the PSO(s) on duty and fully documented. The lead PSO must be granted access to relevant instrumentation documenting acoustic source power and/or operational volume.

### A.1.5 Protected Species Observers

NMFS-approved PSOs must be used during Tier 1-3 surveys; Tier 3 surveys funded/conducted by Federal agencies are exempted from the requirements specified here but must designate qualified shipboard personnel to fulfill this role. Minimum PSO qualifications and required equipment for Tier 1-3 survey types (aside from the aforementioned Tier 3 surveys funded/conducted by Federal agencies) are identified here. The approval process includes NMFS' review of PSO qualifications using standardized guidance for PSO requirements. The number and types of PSOs required are included in the survey-specific sections below.

#### A.1.5.1 Qualifications

1. The operator must use independent, dedicated, trained PSOs, meaning that the PSOs must be employed by a third-party observer provider, must have no tasks other than to conduct observational effort (visual or acoustic[9]), collect data, and communicate with and instruct relevant vessel crew with regard to the presence of protected species and mitigation requirements (including brief alerts regarding maritime hazards), and must have successfully completed an approved PSO training course for geophysical surveys appropriate for their designated task (visual or acoustic). Acoustic PSOs are required to complete specialized training for operating PAM systems and should have familiarity with the vessel and associated equipment with which they will be working, to the extent practicable. PSOs can act as acoustic or visual observers (but not simultaneously) as long as they demonstrate that their training and experience are sufficient to perform each task.
2. NMFS maintains a list of currently approved PSOs. PSO names must be provided to NMFS by the operator for review and confirmation of their approval for specific roles prior to commencement of the survey.[10] For prospective PSOs not previously approved, or for PSOs whose approval is not current, NMFS must review and approve PSO qualifications. Resumes should include information related to relevant education, experience, and training, including dates, duration, location, and description of prior PSO experience. Resumes must be accompanied by relevant documentation of successful completion of necessary training.
3. NMFS may approve PSOs as conditional or unconditional. A conditionally-approved PSO may be one who is trained but has not yet attained the requisite tier- and region-specific experience. An unconditionally-approved PSO is one who has attained the necessary experience within the relevant region. For unconditional approval, the PSO must have a minimum of 90 days at sea performing the role (either visual or acoustic) at the particular Tier level (1–3), with the conclusion of the most recent relevant experience not more than 18 months previous.
4. At least one of the visual and two of the acoustic PSOs (if required) aboard the vessel must be unconditionally-approved. One unconditionally-approved visual PSO must be designated as the lead for the entire PSO team. This lead should typically be the PSO

[9] Acoustic PSOs are only required for Tier 1 surveys.

[10] PSO-related inquiries should be directed to *nmfs.psoreview@noaa.gov*.

with the most experience, would coordinate duty schedules and roles for the PSO team[11], and serve as primary point of contact for the vessel operator. To the maximum extent practicable, the duty schedule must be planned such that unconditionally-approved PSOs are on duty with conditionally-approved PSOs.

5. PSOs must successfully complete relevant training, including completion of all required coursework and passing (80 percent or greater) a written and/or oral examination developed for the training program. Training requirements are described in Baker et al. (2013).
    a) PSOs must have successfully attained a bachelor's degree from an accredited college or university with a major in one of the natural sciences, a minimum of 30 semester hours or equivalent in the biological sciences, and at least one undergraduate course in math or statistics. The educational requirements may be waived if the PSO has acquired the relevant skills through alternate experience. Requests for such a waiver must be submitted to NMFS and must include written justification. Requests must be granted or denied (with justification) by NMFS within one week of receipt of submitted information. Alternate experience that may be considered includes, but is not limited to (1) secondary education and/or experience comparable to PSO duties; (2) previous work experience conducting academic, commercial, or government- sponsored protected species surveys; (3) previous work experience as a PSO (PSO must be in good standing and demonstrate good performance of PSO duties); and (4) traditional knowledge (in Alaska only).

### A.1.5.2 Equipment

The operator is required to:

1. For Tier 1 surveys only (see below), provide PSOs with reticle bigeye binoculars (e.g., 25 x 150; 2.7 view angle; individual ocular focus; height control[12]) of appropriate capability solely for PSO use. These must be pedestal-mounted on the deck at the most appropriate vantage point that provides for optimal sea surface observation, PSO safety, and safe operation of the vessel.
2. Each survey required to have PAM will include a passive acoustic monitoring system that has been verified and tested by the acoustic PSO prior to or during the initiation of survey activities.
3. Work with the selected third-party observer provider to ensure PSOs have all equipment (including backup equipment) needed to adequately perform necessary tasks, including accurate determination of distance and bearing to observed marine mammals, and to ensure that PSOs are capable of calibrating equipment as necessary for accurate distance estimates and species identification. Such equipment, at a minimum, must include:
    a) At least one thermal (infrared) imaging device suited for the marine environment (BOEM program specific).
    b) Reticle binoculars (e.g., 7 x 50) of appropriate quality (at least one per PSO, plus backups).
    c) Global Positioning Units (GPS) (at least one plus backups).
    d) Digital cameras with a telephoto lens that is at least 300 mm or equivalent on a full-frame single lens reflex (SLR) (at least one plus backups). The camera or lens

[11] Responsibility for coordination of duty schedules and roles may be delegated, such as to a shore-based monitoring coordinator employed by the third-party observer provider.

[12] Equipment specifications are provided as examples with regard to appropriate capability only.

should also have an image stabilization system.

e) Equipment necessary for accurate measurement of distances to protected species.
f) Compasses (at least one plus backups).
g) Means of communication among vessel crew and PSOs.
h) Any other tools deemed necessary to adequately and effectively perform PSO tasks.

Equipment specified in (a) through (g) above may be provided by an individual PSO, the third - party observer provider, or the operator, but the latter is responsible for ensuring PSOs have the proper equipment required to perform the duties specified within these protocols.

### A.1.6 Tier-Specific Survey Project Criteria

For purposes of defining mitigation requirements, we differentiate here between requirements for the three survey "tiers" that may reasonably be associated with potential for impacts to protected species (refer to definitions given earlier). Protocols associated with each tier are detailed below.

#### A.1.6.1 Tier 1 Survey Project Criteria

Tier 1 survey protocols are generally considered applicable to surveys using airgun arrays with a total volume greater than 1,500 $in^3$, or with 12 or more airguns. See Table above.

##### A.1.6.1.1 Visual Monitoring

1. During survey operations (e.g., any day on which use of the acoustic source is planned to occur, and whenever the acoustic source is in the water, whether activated or not), a minimum of two PSOs must be on duty and conducting visual observations at all times during daylight hours (i.e., from 30 minutes prior to sunrise through 30 minutes following sunset).
2. Visual monitoring must begin no less than 30 minutes prior to ramp-up and must continue until one hour after use of the acoustic source ceases or until 30 minutes past sunset.
3. Visual PSOs must coordinate to ensure 360° visual coverage around the vessel from the most appropriate observation posts, and must conduct visual observations using binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner.
4. PSOs must establish and monitor applicable shutdown and buffer zones (see below). These zones must be based upon the radial distance from the edges of the airgun array (rather than being based on the center of the array or around the vessel itself). During use of the acoustic source (i.e., anytime the acoustic source is active, including ramp-up), occurrence of protected species within the relevant buffer zone (but outside the shutdown zone) should be communicated to the operator to prepare for the potential shutdown of the acoustic source.
5. Three shutdown zones are defined, depending on the species and context. A standard shutdown zone encompassing the area at and below the sea surface out to a radius of 500 meters (m) from the edges of the airgun array (0–500 m) is defined for marine mammals. For special circumstances, the shutdown zone encompasses an extended distance of 1,500 meters (0–1,500 meters, see Table 2). For sea turtles a standard shutdown zone of 150 meters (0–150 meters) from the edges of the airgun array applies.

6. During pre-start clearance monitoring (i.e., before ramp-up begins), the buffer zone acts as an extension of the shutdown zone in that observations of protected species within the buffer zone would also preclude airgun operations from beginning (i.e., ramp-up). Pre-start clearance zones are defined as follows. For all marine mammals (other than special circumstances), the pre-start clearance zone encompasses the area at and below the sea surface from the edge of the 500-meter shutdown zone out to a radius of 1,000 meters from the edges of the airgun array. For sea turtles, the pre-start clearance zone is the same as the shutdown zone (150 m). No buffer is added to the extended distance shutdown zone (1,500 m).
7. Visual PSOs must immediately communicate all observations of marine mammals to the on-duty acoustic PSO(s), including any determination by the PSO regarding species identification, distance, and bearing and the degree of confidence in the determination.
8. Any observations of protected species by crew members aboard any vessel associated with the survey must be relayed to the PSO team.
9. During good conditions (e.g., daylight hours; Beaufort sea state (BSS) 3 or less), visual PSOs must conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and without use of the acoustic source and between acquisition periods, to the maximum extent practicable.
10. Visual PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least one hour between watches and may conduct a maximum of 12 hours of observation per 24-hour period. Combined observational duties (visual and acoustic but not at the same time) may not exceed 12 hours per 24-hour period for any individual PSO.

#### A.1.6.1.2 Acoustic Monitoring[13]

1. Source vessels must use a towed PAM system at all times[14], which must be monitored by a minimum of one acoustic PSO beginning at least 30 minutes prior to ramp-up, at all times during use of the acoustic source, and until one hour after use of the acoustic source ceases. Remote acoustic PSOs may be utilized in conjunction with at least one vessel-based, unconditionally approved acoustic PSO.
2. Acoustic PSOs must immediately communicate all detections of marine mammals to visual PSOs (when visual PSOs are on duty), including any determination by the PSO regarding species identification, distance and bearing, and the degree of confidence in the determination.
3. Acoustic PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least one hour between watches and may conduct a maximum of 12 hours of observation per 24-hour period. Combined observational duties (acoustic and visual but not at the same time) may not exceed 12 hours per 24-hour period for any individual PSO.
4. Survey activity may continue for 30 minutes when the PAM system malfunctions or is damaged, while the PAM operator diagnoses the issue. If the diagnosis indicates that the PAM system must be repaired to solve the problem, operations may continue for an

[13] See PAM Requirements below for further detail.

[14] PAM may not be required when certain circumstances are present. For example, in the GULF OF AMERICA, use of towed PAM is not required for surveys operating in water depths shallower than 100 meters, and PAM is not required in Cook Inlet, Alaska.

additional five hours without acoustic monitoring during daylight hours only under the following conditions:

a) Sea state is less than or equal to BSS 4;
b) No marine mammals (excluding delphinids) detected solely by PAM in the applicable shutdown zone in the previous two hours;
c) NMFS and BSEE[15] are notified via email as soon as practicable with the time and location in which operations began occurring without an active PAM system; and
d) Operations with an active acoustic source, but without an operating PAM system, do not exceed a cumulative total of ten hours in any 24-hour period.

#### A.1.6.1.3 Pre-start clearance and Ramp-up

A ramp-up procedure, involving a step-wise increase in the number of airguns firing and total active array volume until all operational airguns are activated and the full volume is achieved, is required at all times as part of the activation of the acoustic source. A 30-minute pre-start clearance observation period must occur prior to the start of ramp-up. The intent of pre-start clearance observation (30 minutes) is to ensure no protected species are within the shutdown zones, and buffer zone if applicable, prior to the beginning of ramp-up. The only time detections of protected species in the buffer zone would prevent operations is during pre-start clearance (i.e., the beginning of ramp-up). The intent of ramp-up is to warn protected species of pending operations and to allow sufficient time for those animals to leave the immediate vicinity. All operators must adhere to the following pre-start clearance and ramp-up requirements:

1. The operator must notify a designated PSO of the planned start of ramp-up as agreed upon with the lead PSO; the notification time should not be less than 60 minutes prior to the planned ramp-up in order to allow the PSOs time to monitor the shutdown and buffer zones for 30 minutes prior to the initiation of ramp-up (pre-start clearance). During this 30 minute pre-start clearance period the entire applicable shutdown and buffer zones must be visible, except as indicated in #7 below.
2. Ramp-ups must be scheduled so as to minimize the time spent with the source activated prior to the start of acquisition.
3. A visual PSO conducting pre-start clearance observations must be notified again immediately prior to initiating ramp-up procedures and the operator must receive confirmation from the PSO to proceed.
4. Any PSO on duty has the authority to delay the start of survey operations if a protected species is detected within the applicable pre-start clearance zone.
5. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that mitigation commands are conveyed swiftly while allowing PSOs to maintain watch.
6. When both visual and acoustic PSOs are on duty, all detections of marine mammals must be immediately communicated to the entire on-duty PSO team for potential verification of visual observations by the acoustic PSO or of acoustic detections by visual PSOs.

[15] Notifications to BSEE required for survey activities related to oil and gas, renewable energy, or marine minerals programs in Federal waters.

7. Ramp-up may not be initiated if any protected species is within the applicable shutdown or buffer zone. If a protected species is observed within the applicable shutdown zone or the buffer zone during the 30 minute pre-start clearance period, ramp-up may not begin until the animal(s) has been observed exiting the zones or until an additional time period has elapsed with no further sightings (15 minutes for small odontocetes and pinnipeds and 30 minutes for all other species).
8. Ramp-up must begin by activating a single airgun of the smallest volume in the array and must continue in stages by doubling the number of active elements at the commencement of each stage, with each stage of approximately the same duration. Total ramp-up duration must not be less than 20 minutes. The operator must provide information to the PSO documenting appropriate procedures were followed.
9. PSOs must monitor the shutdown and buffer zones 30 minutes before and during ramp-up, and ramp-up must cease and the source must be shut down upon detection of a protected species within the applicable shutdown zone. Once ramp-up has begun, detections of protected species within the buffer zone do not require shutdown, but such detection must be recorded and communicated to the operator to prepare for potential shutdown.
10. Ramp-up may occur at times of poor visibility, including nighttime, if appropriate acoustic monitoring has occurred with no detections of protected species within the pre-start clearance zone in the 30 minutes prior to beginning ramp-up. Acoustic source activation may only occur at night where operational planning cannot reasonably avoid such circumstances.
11. If the acoustic source is shut down for brief periods (i.e., less than 30 minutes) for reasons other than implementation of prescribed mitigation (e.g., mechanical difficulty), it may be activated again without ramp-up if PSOs have maintained constant visual and/or acoustic observation and no visual or acoustic detections of protected species have occurred within the pre-start clearance zone. For any longer shutdown, pre-start clearance observation and ramp-up are required.
12. Testing of the acoustic source involving all elements requires ramp-up. Testing limited to individual source elements or strings does not require ramp-up but does require a 30-minute pre-start clearance period.

#### A.1.6.1.4 Shutdown

All operators must adhere to the following shutdown requirements:

1. Any PSO on duty has the authority to call for shutdown of the acoustic source if a protected species is detected within the applicable shutdown zone.
2. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that shutdown commands are conveyed swiftly while allowing PSOs to maintain watch.
3. When both visual and acoustic PSOs are on duty, all detections of marine mammals must be immediately communicated to the entire on-duty PSO team for potential verification of visual observations by the acoustic PSO or of acoustic detections by visual PSOs.
4. When the airgun array is active (i.e., anytime one or more airguns is active, including during ramp-up) and (1) a protected species appears within or enters the applicable shutdown zone and/or (2) a marine mammal (excluding delphinids) is detected acoustically and localized within the applicable shutdown zone, the acoustic source must be shut down. When shutdown is instructed by a PSO, the acoustic source must be immediately deactivated and any dispute resolved only following deactivation.

5. The shutdown requirement is waived for small delphinids[16] and pinnipeds.[17]
    a) If a delphinid (individual belonging to the indicated genera of the Family Delphinidae) or pinniped is visually detected within the shutdown zone, no shutdown is required unless the PSO confirms the individual to be of a genus other than those listed, in which case a shutdown is required. Acoustic detection of delphinids does not require shutdown.
6. If there is uncertainty regarding identification of a marine mammal species (i.e., whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived or one of the species with a larger shutdown zone), PSOs may use best professional judgment in making the decision to call for a shutdown.
7. Upon implementation of shutdown, the source may be reactivated after the protected species has been observed exiting the applicable shutdown zone (i.e., animal is not required to fully exit the buffer zone where applicable) or following a clearance period (15 minutes for small odontocetes and 30 minutes for all other species) with no further detection of the protected species. For sea turtles observed in the shutdown zone, a shutdown not requiring ramp-up (i.e., a "pause") is to be implemented until the sea turtle is no longer observed in the shutdown zone.

### A.1.6.2 Tier 2 Survey Protocols

Tier 2 survey protocols are generally considered applicable to surveys using airgun arrays of 1,500 $in^3$ volume or smaller and 12 airguns or fewer, or surveys using single airguns. See Table above.

#### A.1.6.2.1 Visual Monitoring

1. During survey operations (e.g., any day on which use of the acoustic source is planned to occur, and whenever the acoustic source is in the water, whether activated or not), a minimum of two PSOs must be on duty and conducting visual observations at all times during daylight hours (i.e., from 30 minutes prior to sunrise through 30 minutes following sunset).
2. Visual monitoring must begin no less than 30 minutes prior to ramp-up and must continue until one hour after use of the acoustic source ceases or until 30 minutes past sunset.
3. Visual PSOs must coordinate to ensure 360° visual coverage around the vessel from the most appropriate observation posts, and must conduct visual observations using binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner.
4. PSOs must establish and monitor applicable shutdown and buffer zones (see below). These zones must be based upon the radial distance from the edges of the airgun array (or single airgun) (rather than being based on the center of the array or around the vessel itself). During use of the acoustic source (i.e., anytime the acoustic source is active, including ramp-up), occurrence of protected species within the relevant buffer zone (but

[16] Applicable genera will be specific to the region, and include the following: *Delphinus*, *Lagenodelphis*, *Lagenorhynchus*, *Lissodelphis*, *Stenella*, *Steno*, and *Tursiops*. This list may be revised as taxonomy changes.
[17] Waiver for pinnipeds may not be applicable for surveys that may affect ESA-listed pinnipeds.

outside the shutdown zone) should be communicated to the operator to prepare for the potential shutdown of the acoustic source.

5. Two shutdown zones are defined, depending on the species and context. Here, a standard shutdown zone encompassing the area at and below the sea surface out to a radius of 100 meters from the edges of the airgun array (0–100 meters) is defined for marine mammals and sea turtles. For special circumstances, the shutdown zone encompasses an extended distance of 500 meters (0-500 meters, see Table 2).
6. During pre-start clearance monitoring (i.e., before ramp-up begins), the buffer zone also acts as an extension of the shutdown zone in that observations of protected species within the buffer zone would also preclude airgun operations from beginning (i.e., ramp-up). Pre-start clearance zones are defined as follows. For all marine mammals (other than special circumstances), the pre-start clearance zone encompasses the area at and below the sea surface from the edge of the 100-meter shutdown zone out to a radius of 200 meters from the edges of the airgun array (or single airgun). For sea turtles, the pre-start clearance zone encompasses the area at and below the sea surface from the edge of the 100-meter shutdown zone. No buffer is added to the extended distance shutdown zone (500 m).
7. Any observations of protected species by crew members aboard any vessel associated with the survey must be relayed to the PSO team.
8. During good conditions (e.g., daylight hours; Beaufort sea state (BSS) 3 or less), visual PSOs must conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and without use of the acoustic source and between acquisition periods, to the maximum extent practicable.
9. Visual PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least one hour between watches and may conduct a maximum of 12 hours of observation per 24-hour period.

#### A.1.6.2.2 Pre-start Clearance and Ramp-up

A ramp-up procedure, involving a step-wise increase in the number of airguns firing and total active array volume until all operational airguns are activated and the full volume is achieved, is required at all times as part of the activation of the acoustic source. (Ramp-up is not relevant for surveys using a single airgun as the acoustic source.) A 30-minute pre-start clearance observation period must occur prior to the start of ramp-up. The intent of pre-start clearance observation (30 minutes) is to ensure no protected species are within the shutdown zones, and buffer zone if applicable, prior to the beginning of ramp-up. The only time detections of protected species in the buffer zone would prevent operations is during pre-start clearance (i.e., the beginning of ramp-up or single airgun testing). The intent of ramp-up is to warn protected species of pending operations and to allow sufficient time for those animals to leave the immediate vicinity. All operators must adhere to the following pre-start clearance and ramp-up requirements:

1. The operator must notify a designated PSO of the planned start of ramp-up as agreed upon with the lead PSO; the notification time should not be less than 60 minutes prior to the planned ramp-up in order to allow the PSOs time to monitor the shutdown and buffer zones for 30 minutes prior to the initiation of ramp-up (pre-start clearance). During this 30-minute pre-start clearance period the entire applicable shutdown and buffer zones must be visible, except as indicated below (see item **7.**).

2. Ramp-ups must be scheduled so as to minimize the time spent with the source activated prior to the start of acquisition.
3. A visual PSO conducting pre-start clearance observations must be notified again immediately prior to initiating ramp-up procedures and the operator must receive confirmation from the PSO to proceed.
4. Any PSO on duty has the authority to delay the start of survey operations if a protected species is detected within the applicable pre-start clearance zone.
5. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that mitigation commands are conveyed swiftly while allowing PSOs to maintain watch.
6. Ramp-up may not be initiated if any protected species is within the applicable shutdown or buffer zone. If a protected species is observed within the applicable shutdown zone or the buffer zone during the 30-minute pre-start clearance period, ramp-up may not begin until the animal(s) has been observed exiting the zones or until an additional time period has elapsed with no further sightings (15 minutes for small odontocetes and pinnipeds and 30 minutes for all other species).
7. Ramp-up must begin by activating a single airgun of the smallest volume in the array and must continue in stages by doubling the number of active elements at the commencement of each stage, with each stage of approximately the same duration. Total ramp-up duration will be dependent on the number of array elements. The operator must provide information to the PSO documenting appropriate procedures were followed.
8. PSOs must monitor the shutdown and buffer zones 30 minutes before and during ramp-up, and ramp-up must cease and the source must be shut down upon observation of a protected species within the applicable shutdown zone. Once ramp-up has begun, observations of protected species within the buffer zone do not require shutdown, but such observation must be recorded and communicated to the operator to prepare for potential shutdown.
9. Ramp-up may occur at times of poor visibility, including nighttime, if appropriate visual monitoring has occurred with no detections of protected species in the 30 minutes prior to beginning ramp-up. Acoustic source activation may only occur at night where operational planning cannot reasonably avoid such circumstances.
10. If the acoustic source is shut down for brief periods (i.e., less than 30 minutes) for reasons other than implementation of prescribed mitigation (e.g., mechanical difficulty), it may be activated again without ramp-up if PSOs have maintained constant visual observation and no detections of protected species have occurred within the applicable shutdown zone. For any longer shutdown, pre-start clearance observation and ramp-up are required.
11. Testing of the acoustic source involving all elements requires ramp-up. Testing limited to individual source elements or strings does not require ramp-up but does require a 30-minute pre-start clearance period.

#### A.1.6.2.3 Shutdown

All operators must adhere to the following shutdown requirements:

1. Any PSO on duty has the authority to call for shutdown of the acoustic source if a protected species is detected within the applicable shutdown zone.
2. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that shutdown commands are conveyed swiftly while allowing PSOs to maintain watch.
3. When the acoustic source is active (i.e., anytime one or more airguns is active, including during ramp-up) and a protected species appears within or enters the applicable shutdown zone, the acoustic source must be shut down. When shutdown is instructed by a PSO, the acoustic source must be immediately deactivated and any dispute resolved only following deactivation.
4. The shutdown requirement is waived for small delphinids and pinnipeds.
    a) If a delphinid (individual belonging to the indicated genera of the Family Delphinidae) or pinniped is visually detected within the shutdown zone, no shutdown is required unless the PSO confirms the individual to be of a genus other than those listed, in which case a shutdown is required.
5. If there is uncertainty regarding identification of a marine mammal species (i.e., whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived or one of the species with a larger shutdown zone), PSOs may use best professional judgment in making the decision to call for a shutdown.
6. Upon implementation of shutdown, the source may be reactivated after the protected species has been observed exiting the applicable shutdown zone (i.e., animal is not required to fully exit the buffer zone where applicable) or following a clearance period (15 minutes for small odontocetes and 30 minutes for all other species) with no further detection of the marine mammal(s). For sea turtles observed in the shutdown zone, a shutdown not requiring ramp-up (i.e., a "pause") is to be implemented until the sea turtle is no longer observed in the shutdown zone.

### A.1.6.3 Tier 3 Survey Protocols

Tier 3 survey protocols are generally considered applicable to surveys using sparkers and some other sources that have not yet been fully evaluated to the point that a final determination has been made about their tiering (e.g., 1- and 2-plate boomers and bubble guns). Operators may elect to implement Tier 3 mitigation protocols to avoid potential take of marine mammals, or may instead elect to request an incidental take authorization under the MMPA in lieu of implementing these protocols. See Table above.

#### A.1.6.3.1 Visual Monitoring

1. During survey operations (e.g., any day on which use of the acoustic source is planned to occur, and whenever the acoustic source is in the water, whether activated or not), a minimum of one PSO must be on duty and conducting visual observations at all times during daylight hours (i.e., from 30 minutes prior to sunrise through 30 minutes following sunset).
2. Qualified shipboard personnel may be designated by the operator to fulfill these roles during Federally funded/conducted research. PSOs must be NMFS-approved for other Tier 3 survey effort.
3. Visual monitoring must begin no less than 30 minutes prior to ramp-up and must continue until one hour after use of the acoustic source ceases or until 30 minutes past sunset.
4. Visual PSOs must coordinate to ensure 360° visual coverage around the vessel from the most appropriate observation posts and must conduct visual observations using

binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner.

5. PSOs must establish and monitor applicable shutdown zones (see below). These zones must be based upon the radial distance from the acoustic source (rather than being based around the vessel itself).
6. Two shutdown zones are defined, depending on the species and context. Here, a standard shutdown zone encompassing the area at and below the sea surface out to a radius of 100 meters from the sound source (0–100 meters) is defined for marine mammals and sea turtles. For special circumstances, the shutdown zone encompasses an extended distance of 500 meters (0-500 meters, see Table 2).
7. Any observations of protected species by crew members aboard any vessel associated with the survey must be relayed to the PSO team.
8. Visual PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least one hour between watches and may conduct a maximum of 12 hours of observation per 24-hour period.

#### A.1.6.3.2 Pre-start Clearance and Ramp-up

A ramp-up procedure, involving a gradual increase in source level output, is required at all times as part of the activation of the acoustic source when technically feasible. Operators should ramp up sources to half power for 5 minutes and then proceed to full power. A 30-minute pre-start clearance observation period must occur prior to the start of ramp-up. The intent of pre-start clearance observation (30 minutes) is to ensure no protected species are within the shutdown zones prior to the beginning of ramp-up. The intent of ramp-up is to warn protected species of pending operations and to allow sufficient time for those animals to leave the immediate vicinity. All operators must adhere to the following pre-start clearance and ramp-up requirements:

1. The operator must notify a designated PSO of the planned start of ramp-up as agreed upon with the lead PSO; the notification time should not be less than 60 minutes prior to the planned ramp-up in order to allow the PSOs time to monitor the shutdown zones for 30 minutes prior to the initiation of ramp-up (pre-start clearance). During this 30-minute pre-start clearance period the entire applicable shutdown zone must be visible, except as indicated below (see #7 below).
2. Ramp-ups must be scheduled so as to minimize the time spent with the source activated.
3. A visual PSO conducting pre-start clearance observations must be notified again immediately prior to initiating ramp-up procedures and the operator must receive confirmation from the PSO to proceed.
4. Any PSO on duty has the authority to delay the start of survey operations if a protected species is detected within the applicable pre-start clearance zone.
5. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that mitigation commands are conveyed swiftly while allowing PSOs to maintain watch.
6. Ramp-up may not be initiated if any protected species is within the applicable shutdown zone. If a protected species is observed within the applicable shutdown zone during the 30-minute pre-start clearance period, ramp-up may not begin until the animal(s) has been observed exiting the zones or until an additional time period has elapsed with no further sightings (15 minutes for small odontocetes and pinnipeds and 30 minutes for all other species).

7. PSOs must monitor the shutdown zones 30 minutes before and during ramp-up, and ramp-up must cease and the source must be shut down upon observation of a protected species within the applicable shutdown zone.
8. Ramp-up may occur at times of poor visibility, including nighttime, if appropriate visual monitoring has occurred with no detections of protected species in the 30 minutes prior to beginning ramp-up. Acoustic source activation may only occur at night where operational planning cannot reasonably avoid such circumstances.
9. If the acoustic source is shut down for brief periods (i.e., less than 30 minutes) for reasons other than implementation of prescribed mitigation (e.g., mechanical difficulty), it may be activated again without ramp-up if PSOs have maintained constant visual observation and no detections of protected species have occurred within the applicable shutdown zone. For any longer shutdown, pre-start clearance observation and ramp-up are required.

#### A.1.6.3.3 Shutdown

All operators must adhere to the following shutdown requirements:

1. Any PSO on duty has the authority to call for shutdown of the acoustic source if a protected species is detected within the applicable shutdown zone.
2. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that shutdown commands are conveyed swiftly while allowing PSOs to maintain watch.
3. When the acoustic source is active and a protected species appears within or enters the applicable shutdown zone, the acoustic source must be shut down. When shutdown is instructed by a PSO, the acoustic source must be immediately deactivated and any dispute resolved only following deactivation.
4. The shutdown requirement is waived for small delphinids and pinnipeds.
    a) If a delphinid (individual belonging to the indicated genera of the Family Delphinidae) or pinniped is visually detected within the shutdown zone, no shutdown is required unless the PSO confirms the individual to be of a genus other than those listed, in which case a shutdown is required.
5. If there is uncertainty regarding identification of a marine mammal species (i.e., whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived or one of the species with a larger shutdown zone), PSOs may use best professional judgment in making the decision to call for a shutdown.
6. Upon implementation of shutdown, the source may be reactivated after the protected species has been observed exiting the applicable shutdown zone or following a clearance period (15 minutes for small odontocetes and 30 minutes for all other species) with no further detection of the protected species. For sea turtles observed in the shutdown zone, a voluntary shutdown not requiring ramp-up (i.e., a "pause") may be implemented until the sea turtle is no longer observed in the shutdown zone.

### A.1.7 Additional Standard Project Criteria

The following protocols are required when relevant, regardless of tier.

### A.1.7.1 Entanglement and Entrainment Risk Reduction

All lines (rope, chain, cable, etc.) associated with geophysical surveys should be stiff, taut, and non-looping to the extent practicable to avoid possible entanglement and entrainment risk. When feasible, flexible lines such as nylon or polypropylene that could loop or tangle protected species should be enclosed in a sleeve to add rigidity and prevent looping or tangling. No excess underwater line is allowed. Equipment, especially towed apparatuses (e.g., tail buoys), must be operated in a way as to prevent entrainment of sea turtles or other protected species to the extent feasible.

### A.1.7.2 Nodal Survey Requirements

To avoid the risk of entanglement, BOEM permit-holders conducting surveys using ocean-bottom nodes or similar gear must:

1. Use negatively buoyant coated wire-core tether cable;
2. Ensure all cables/lines are designed to be rigid;
3. Retrieve all lines immediately following completion of the survey; and
4. Attach acoustic pingers directly to the coated tether cable; acoustic releases should not be used.

### A.1.8 Vessel Strike Avoidance Requirements

Crew and supply vessel personnel should use an appropriate reference guide that includes identifying information on all marine mammals, sea turtles, and other marine aquatic protected species that may be encountered. Vessel operators must comply with the below measures except under extraordinary circumstances when the **safety of the vessel or crew is in doubt or the safety of life at sea is in question**. These requirements do not apply in any case where compliance would create an imminent and serious threat to a person or vessel or to the extent that a vessel is restricted in its ability to maneuver and, because of the restriction, cannot comply (e.g., having an array).

1. Vessel operators and crews must maintain a vigilant watch for all protected species and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any protected species. A single protected species at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures should always be exercised. A visual observer aboard the vessel must monitor a vessel strike avoidance zone around the vessel (species-specific distances detailed below). Visual observers monitoring the vessel strike avoidance zone may be third-party observers (i.e., PSOs) or crew members, but crew members responsible for these duties must be provided sufficient training[18] to 1) distinguish protected species from other phenomena and 2) broadly to identify a marine mammal as a right whale, other whale (defined in this context as sperm whales or baleen whales other than right whales), or other marine mammals.
2. All vessels (e.g., source vessels, chase vessels, supply vessels), regardless of size, must observe a 10-knot speed restriction in specific areas designated by NMFS for the protection of North Atlantic right whales from vessel strikes. These include all Seasonal

[18] For example, see the U.S. Navy's Marine Species Awareness Training: https://www.youtube.com/watch?v=KKo3r1yVBBA

Management Areas (SMA) (when in effect) and any dynamic management areas (DMA) (when in effect). See www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-ship-strikes-north-atlantic-right-whales for specific detail regarding these areas.

3. In the Gulf of America, all vessels (e.g., source vessels, chase vessels, supply vessels), regardless of size, must observe a 10-knot speed restriction in the 2020 Rice's Whale Area (2020 RWA), as identified in the Biological and Conference Opinion on Bureau of Ocean Energy Management's Oil and Gas Program Activities in the Gulf of America, which is the area from 100- to 400- meter isobaths from 87.5º W to 27.5º N plus an additional 10 km around that area.
4. In the Gulf of Alaska and Bering Sea, all vessels (e.g., source vessels, chase vessels, supply vessels), regardless of size, must observe a 10-knot speed restriction while within designated North Pacific right whale critical habitat.
5. Vessel speeds must also be reduced to 10 knots or less when mother/calf pairs, pods, or large assemblages of cetaceans are observed near a vessel.
6. All vessels must maintain a minimum separation distance of 500 m from right whales. If a right whale is sighted within the relevant separation distance, the vessel must steer a course away at 10 knots or less until the 500-m separation distance has been established. If a whale is observed but cannot be confirmed as a species other than a right whale, the vessel operator must assume that it is a right whale and take appropriate action. In the Gulf of America, this requirement is expanded to include any species of baleen whale.
7. All vessels must maintain a minimum separation distance of 100 m from sperm whales and all other baleen whales.
8. All vessels must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m from all other protected species, with an understanding that at times this may not be possible (e.g., for animals that approach the vessel).
9. When protected species are sighted while a vessel is underway, the vessel must take action as necessary to avoid violating the relevant separation distance (e.g., attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area, reduce speed and shift the engine to neutral). This does not apply to any vessel towing gear or any vessel that is navigationally constrained.

### A.1.9 Data Collection[19]

PSOs must use standardized electronic data forms to record data. PSOs must record detailed information about any implementation of mitigation requirements, including the distance of protected species to the acoustic source and description of specific actions that ensued, the behavior of the animal(s), any observed changes in behavior before and after implementation of mitigation, and if shutdown was implemented, the length of time before any subsequent ramp-up of the acoustic source. If required mitigation was not implemented, PSOs should record a description of the circumstances. At a minimum, the following information must be recorded:

[19] Data collection and reporting (see below) requirements reference requirements that may be transmitted to an operator via permit, ITA, ITS, and/or lease stipulations. Outside of these contexts, data collection and reporting may not be required.

1. Vessel names (source vessel and other vessels associated with survey), vessel size and type, maximum speed capability of vessel[20];
2. Dates of departures and returns to port with port name;
3. PSO names and affiliations;
4. Date and participants of PSO briefings (as discussed in **A.1.4. General Requirements**, item 2.);
5. Visual monitoring equipment used;
6. PSO location on vessel and height of observation location above water surface;
7. Dates and times (Greenwich Mean Time) of survey on/off effort and times corresponding with PSO on/off effort;
8. Vessel location (decimal degrees) when survey effort begins and ends and vessel location at beginning and end of visual PSO duty shifts;
9. Vessel location at 30-second intervals if obtainable from data collection software, otherwise at practical regular interval;
10. Vessel heading and speed at beginning and end of visual PSO duty shifts and upon any change;
11. Water depth (if obtainable from data collection software);
12. Environmental conditions while on visual survey (at beginning and end of PSO shift and whenever conditions change significantly), including BSS and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon;
13. Factors that may contribute to impaired observations during each PSO shift change or as needed as environmental conditions change (e.g., vessel traffic, equipment malfunctions);
14. Survey activity information (and changes thereof), such as acoustic source power output while in operation, number and volume of airguns operating in an array, tow depth of an acoustic source, and any other notes of significance (i.e., pre-start clearance, ramp-up, shutdown, testing, shooting, ramp-up completion, end of operations, streamers, etc.); and
15. Upon visual observation of any protected species, the following information:

a) Watch status (sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform);
b) Vessel/platform/survey activity at time of sighting (e.g., deploying, recovering, testing, shooting, data acquisition, other);
c) PSO who sighted the animal;
d) Time of sighting;
e) Initial detection method;
f) Sightings cue;
g) Vessel location at time of sighting (decimal degrees);
h) Water depth;
i) Direction of vessel's travel (compass direction);
j) Speed of the vessel(s) from which the observation was made;
k) Direction of animal's travel relative to the vessel;
l) Identification of the animal (e.g., genus/species, lowest possible taxonomic level, or unidentified), and the composition of the group if there is a mix of species;
m) Species reliability (an indicator of confidence in identification);
n) Estimated distance to the animal and method of estimating distance;
o) Estimated number of animals (high/low/best);

[20] Data collection requirements referencing vessels and related data are not applicable to surveys conducted with a stationary acoustic source, e.g., 0-offset vertical seismic profiling.

p) Estimated number of animals by cohort (e.g., adults, yearlings, juveniles, calves, group composition);
q) Description (as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics);
r) Detailed behavior observations (e.g., number of blows/breaths, number of surfaces, breaching, spyhopping, diving, feeding, traveling; as explicit and detailed as possible; note any observed changes in behavior before and after point of closest approach);
s) Animal's closest point of approach and/or closest distance from any element of the acoustic source; and
t) Description of any actions implemented in response to the sighting (e.g., delays, shutdown, ramp-up) and time and location of the action.

16. If a marine mammal is detected using a PAM system, the following additional information should be recorded:

u) An acoustic encounter identification number, and whether the detection was linked with a visual sighting;
v) Date and time when first and last heard;
w) Types and nature of sounds heard (e.g., clicks, whistles, creaks, burst pulses, continuous, sporadic, strength of signal);
x) Any additional information recorded such as water depth of the hydrophone array, bearing of the animal to the vessel (if determinable), species or taxonomic group (if determinable), spectrogram screenshot, and any other notable information.

### A.1.10 Reporting[21]

1. The operator must submit a draft comprehensive report (see ITA and/or permit for contact information) on all activities and monitoring results within 90 days of the completion of the survey or expiration of the ITA and/or permit, whichever comes sooner. The report must describe all activities conducted and sightings of protected species, must provide full documentation of methods, results, and interpretation pertaining to all monitoring, and must summarize the dates and locations of survey operations and all protected species sightings (dates, times, locations, activities, associated survey activities). The draft report must also include geo-referenced time-stamped vessel tracklines for all time periods during which acoustic sources were operating. Tracklines should include points recording any change in acoustic source status (e.g., when the sources began operating, when they were turned off, or when they changed operational status such as from full array to single airgun or vice versa). GIS files must be provided in ESRI shapefile format and include the UTC date and time, latitude in decimal degrees, and longitude in decimal degrees. All coordinates must be referenced to the WGS84 geographic coordinate system. In addition to the report, all raw observational data must be made available. The report must summarize the information submitted in interim monthly reports (if required) as well as additional data collected as described above in *Data Collection*. A final report must be submitted within 30 days following resolution of any comments on the draft report.

[21] Reporting as required through relevant regulatory authorities and documents issued by BOEM, and NMFS if applicable under ESA or MMPA.

2. For operations requiring the use of PAM, the report must include a validation document concerning the use of PAM, which should include necessary noise validation diagrams and demonstrate whether background noise levels on the PAM deployment limited achievement of the planned detection goals. Copies of any vessel self-noise assessment reports must be included with the report. See **PAM Requirements** below.
3. Reporting injured or dead protected species: Sightings of any injured or dead protected species must be reported to NMFS, regardless of the cause of injury or death.

For reporting dead or injured marine mammals, refer to the reporting requirements described below. For reporting other dead or injured protected species, refer to NMFS' website at https://www.fisheries.noaa.gov/report.

In the event that personnel involved in the survey activities discover an injured or dead marine mammal, the incident must be reported to NMFS and to the applicable regional stranding network(s) as soon as feasible. The report must include the following information:

a) Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
b) Species identification (if known) or description of the animal(s) involved;
c) Condition of the animal(s) (including carcass condition if the animal is dead);
d) Observed behaviors of the animal(s), if alive;
e) If available, photographs or video footage of the animal(s); and
f) General circumstances under which the animal was discovered.

In the event of a ship strike of a marine mammal by any vessel involved in the survey activities, the incident must be reported to NMFS and to the regional stranding network(s) as soon as feasible. The report must include the following information:

g) Time, date, and location (latitude/longitude) of the incident;
h) Species identification (if known) or description of the animal(s) involved;
i) Vessel's speed during and leading up to the incident;
j) Vessel's course/heading and what operations were being conducted (if applicable);
k) Status of all sound sources in use;
l) Description of any avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike;
m) Environmental conditions (e.g., wind speed and direction, BSS, cloud cover, visibility) immediately preceding the strike;
n) Estimated size and length of animal that was struck;
o) Description of the behavior of the marine mammal immediately preceding and/or following the strike;
p) If available, description of the presence and behavior of any other marine mammals immediately preceding the strike;
q) Estimated fate of the animal (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared); and
r) To the extent practicable, photographs or video footage of the animal(s).

### A.1.10.1 Marine Mammal Stranding

Marine mammals involved in live stranding events (or near-shore atypical milling) are considered especially susceptible to the effects of additional stressors. The shutdown procedures below are not related to the investigation of the cause of any such stranding and their

implementation is not intended to imply that the activity of the authorized entity is the cause of the stranding. Rather, shutdown procedures are intended to protect marine mammals exhibiting indicators of distress by minimizing their exposure to possible additional stressors, regardless of the factors that contributed to the stranding.

In the event of a live stranding (or near-shore atypical milling) event within 50 km of the survey operations, where the NMFS stranding network is engaged in herding or other interventions to return animals to the water, NMFS will advise of the need to implement shutdown procedures for all active acoustic sources operating within 50 km of the stranding. Shutdown procedures for live stranding or milling marine mammals include the following:

1. If at any time, the marine mammal(s) die or are euthanized, or if herding/intervention efforts are stopped, NMFS will advise that the shutdown around the animals' location is no longer needed.
2. Otherwise, shutdown procedures will remain in effect until NMFS determines and advises that all live animals involved have left the area (either of their own volition or following an intervention).
3. If further observations of the marine mammals indicate the potential for re-stranding, additional coordination will be required to determine what measures are necessary to minimize that likelihood (e.g., extending the shutdown or moving operations farther away) and to implement those measures as appropriate.

If NMFS determines that the circumstances of any marine mammal stranding found in the vicinity of the activity suggest investigation of the association with survey activities is warranted, and an investigation into the stranding is being pursued, NMFS will submit a written request indicating that the following initial available information must be provided as soon as possible, but no later than 7 business days after the request for information:

1. Status of all sound source use in the 48 hours preceding the estimated time of stranding and within 50 km of the discovery/notification of the stranding by NMFS; and
2. If available, description of the behavior of any marine mammal(s) observed preceding (i.e., within 48 hours and 50 km) and immediately after the discovery of the stranding.
3. In the event that the investigation is still inconclusive, the investigation of the association of the survey activities is still warranted, and the investigation is still being pursued, NMFS may provide additional information requests, in writing, regarding the nature and location of survey operations prior to the time period above.

### A.1.11 References

Baker K, Epperson D, Gitschlag G, Goldstein H, Lewandowski J, Skrupky K, et al. 2013. National standards for a protected species observer and data management program: a model using geological and geophysical surveys. NOAA Technical Memorandum NMFS-OPR-49, National Marine Fisheries Service.

**Table 2. Extended Distance, Shutdown Zone, Species and Context.**[1]

| Species and/or Group | Shutdown Zone (meters) Tier 1 | Shutdown Zone (meters) Tier 2/3 |
|---|---|---|
| North Atlantic right whale (*Eubalaena glacialis*) | 0-1,500 | 0-500 |
| North Pacific right whale (*Eubalaena japonica*) | 0-1,500 | 0-500 |
| Rice's whale (*Balaenoptera ricei*) | 0–1,500 | 0–500 |
| Beaked whales (*Ziphiidae spp.*) | 0–1,500 | 0–500 |
| Dwarf and pygmy sperm whales (*Kogia spp.*) | 0–1,500 | 0–500 |
| Southern resident killer whale (*Orcinus orca*) | 0-1,500 | 0-500 |
| Cook Inlet beluga whales (*Delphinapterus leucas*) | 0-1,500 | 0-500 |
| Large whale with calf [2] | 0–1,500 | 0–500 |
| Groups (6+) of large whales | 0–1,500 | 0–500 |

[1] This list is not exhaustive. Other species or circumstances may warrant use of the extended shutdown zone in certain situations.

[2] "Large whale" is defined as a sperm whale or any baleen whale; calf defined as an animal less than two -thirds the body size of an adult observed to be in close association with an adult.

## PAM Requirements

Towed PAM systems should consist of hardware (e.g., hydrophone array, recorder, cables) and software (e.g., data processing program and algorithm). Some type of automated detection software must be used. Acoustic signals are processed for output to the PAM operator with software designed to detect marine mammal vocalizations. Current PAM technology has some limitations (e.g., limited directional capabilities and detection range, detection of signals due to vessel and flow noise, low accuracy in localization) and there are no formal guidelines currently in place regarding specifications for hardware, software, or operator training requirements.

BOEM and NMFS' requirement to use PAM refers to the use of calibrated hydrophone arrays with full system redundancy to detect, identify, and estimate distance and bearing to vocalizing cetaceans, to the extent possible. With regard to calibration, the PAM system should have at least one calibrated hydrophone, sufficient for determining whether background noise levels on the towed PAM system are sufficiently low to meet performance expectations. Additionally, if multiple hydrophone types occur in a system (i.e., monitor different bandwidths), then one hydrophone from each such type must be calibrated, and whenever sets of hydrophones (of the same type) are sufficiently spatially separated such that they would be expected to experience ambient noise environments that differ by 6 dB or more across any integrated species cluster bandwidth, then at least one hydrophone from each set should be calibrated. In terms of calibrating the rest of the system, the signal route to the data recorder and monitoring software must be calibrated so that the binary amplitude data written to hard disk can be converted into units of acoustic pressure.

The configuration of hardware should be coupled with appropriate software to aid monitoring and listening by a PAM operator skilled in bioacoustics analysis and computer system specifications capable of running appropriate software. GPS data acquisition is recommended for all PAM operations. If the PAM plan (see below) claims an ability to localize, every localization estimate obtained from a PAM system must be accompanied by some estimate of uncertainty and ambiguity.

In the absence of formal standards addressing any of these three facets of PAM technology, all Tier 1 survey operators must provide a PAM plan including description of the hardware and software proposed for use. Following the survey, a validation document must be submitted as part of required reporting (see below). The purpose of the PAM plan is to demonstrate that the PAM system being proposed for use is adequate for addressing the mitigation goals. The plan must include methodology and documentation requirements for all stages of the project. As recommended by Thode et al. (2017), PAM plans should, at minimum, adequately address and describe (1) the hardware and software planned for use, including a hardware performance

diagram demonstrating that the sensitivity and dynamic range of the hardware is appropriate for the operation; (2) deployment methodology, including target depth/tow distance; (3) definitions of expected operational conditions, used to summarize background noise statistics; (4) proposed detection-classification-localization methodology, including anticipated species clusters (using a cluster definition table), target minimum detection range for each cluster, and the proposed localization method for each cluster; (5) operation plans, including the background noise sampling schedule; (6) array design considerations for noise abatement; and (7) cluster-specific details regarding which real-time displays and automated detectors the operator would monitor.

Where relevant, the plan should address the potential for PAM deployment on a receiver vessel or other associated vessel separate from the acoustic source.

*Species clusters* – The plan must list the species of concern during the upcoming operation. While some species may be listed individually for special attention, in many circumstances it is

expected that for the purposes of a PAM operation multiple species can be grouped together in a "cluster" that shares similar acoustic and behavioral characteristics (e.g., sperm whale, beaked whales). The plan must specify a target minimum detection (and possibly localization) range for each species cluster used in the document. Different ranges can be defined for different operational conditions. The PAM system may exceed this detection range, but must always be capable of achieving this minimum detection range.

*Hardware and software specifications* – The plan must have a section dedicated to demonstrating that the PAM hardware is sensitive enough to detect signals from the species clusters of concern at the target minimum detection ranges specified. The plan should include a hardware specification table and hardware performance diagram. The diagram will show the sensitivity and bandwidth of the combined array hardware and recording system, as well as the received levels required for a given species cluster to be detectable at the target minimum detection range. The overall goal of the diagram is to visually demonstrate that the planned PAM array/recording system would have the capability of detecting various species clusters at required target ranges, provided that background noise levels are not an issue.

*Operational conditions* – The validation document should demonstrate whether the PAM system has been compromised by excessive background noise, whether that noise is electronic interference, flow, platform, or environmental noise. Therefore, the plan must define a set of "operational conditions" under which detection statistics (background noise profiles) will be categorized during the project. Operational conditions consist of three categories: platform activity and status, mitigation (activity) status, and environmental status.

*Operating procedures* – The plan must describe the level of effort that is reasonably expected to occur for the monitoring requirements. For every species cluster, the plan should detail which part of the PAM display would be used for detecting that cluster. For example, if a scrolling spectrogram display is being used for a species cluster, then the spectrogram's fast Fourier transform sample size, frequency bandwidth, and their refresh rate must be specified. Similar details would be provided for other software tools, such as click detectors and other automated detectors and classifiers. The plan must also provide a screenshot of the expected monitor display.

In coordination with vessel crew, the lead PAM operator will be responsible for deployment, retrieval, and testing and optimization of the hydrophone array. While on duty, the PAM operator must diligently listen to received signals and/or monitoring display screens in order to detect vocalizing cetaceans, except as required to attend to PAM equipment. The PAM operator must use appropriate sample analysis and filtering techniques and must report all cetacean detections. While not required prior to development of formal standards for PAM use, NMFS recommends that vessel self-noise assessments be undertaken during mobilization in order to optimize PAM array configuration according to the specific noise characteristics of the vessel and equipment involved, and to refine expectations for distance/bearing estimations for cetacean species during the survey. Copies of any vessel self-noise assessment reports must be included with the summary trip report.

This report must also include a validation document concerning the use of PAM, which should include necessary noise validation diagrams (NVD) and demonstrate whether background noise levels on the PAM deployment limited achievement of the planned detection goals. A separate diagram must be produced for every background noise percentile chosen for analysis.

Background noise percentiles, rather than a simple average of the data, are required because the highly non-stationary characteristics of many background noise profiles cannot be described by a simple mean. For example, data collected during a seismic survey will have short periods of time containing high-intensity pulses and longer periods of time dominated by lower levels of reverberation. Taking a simple mean of these noise data would imply background noise levels substantially higher than what may actually have been present between seismic pulses. A validation report would typically contain between three to five diagrams, depending on the number of percentiles analyzed. At a minimum, the validation report should contain three diagrams that include the 50th percentile (median), 5th percentile, and 95th percentile. The 25th percentile and 75th percentile may also be included. In each percentile diagram, a separate background noise curve must be drawn for each defined operational condition. In general, the NVD should be generated from the data stream that is used for detecting the presence of marine mammal signals. For example, if beamforming or some other form of array gain has been applied before invoking signal detection, then the NVD should be generated using the beamformed data, and not omnidirectional data. The complete set of NVDs, one for each percentile of interest, combined with a table that lists the fraction of time the activity was in each operational state, provides a means of reviewing the background noise-limitations encountered by the PAM system during various operational conditions. Actual marine mammal detections should be plotted on this diagram for a reasonableness check on the expected received levels.

Overall, the validation document should reiterate all the goals and parameters stated in the planning document and verify that goals were/were not met, why, changes, etc. Also, the validation document should state whether the planning was suited to the needs of the survey and met the required mitigation standards.

# ATTACHMENT 2: THE BUREAUS' MARINE DEBRIS PROJECT CRITERIA

## A.2 MARINE DEBRIS

Marine debris poses a threat to fish, marine mammals, sea turtles, and potentially other marine animals; causes costly delays and repairs for commercial and recreational boating interests; detracts from the aesthetic quality of recreational shore fronts; and increases the cost of beach and park maintenance. The discharge of garbage and debris has been the subject of strict laws, such as MARPOL-Annex V and the Marine Debris Act, 33 U.S.C. 1951 et seq., and regulations imposed by various agencies including the United States Coast Guard (USCG) and the U.S. Environmental Protection Agency (USEPA).

These protocols will be implemented by BOEM, BSEE, and lessees in complying with OCSLA (43 U.S.C. §§ 1331 et. seq), ESA (16 U.S.C. §§ 1531-1544) and/or MMPA (16 U.S.C. §§1361-1423h). The BOEM/BSEE proposed action under the 2025 NMFS BiOp includes robust avoidance or minimization measures (i.e., protocols), and those measures will continue to be implemented in the Gulf of America as project criteria under the 2026 Endangered Species Committee Order, as well as pursuant to the Bureaus' authority under OCSLA (43 U.S.C. §§ 1331 et seq.).

### A.2.1 Definitions

Marine debris means as any object or fragment of wood, metal, glass, rubber, plastic, cloth, paper or any other solid, human-made item or material that is lost or discarded in the marine environment by the Lessee while conducting oil and gas activities on the OCS in connection with a lease, grant, or approval issued by BOEM and BSEE.

### A.2.2 Protocol

#### A.2.1.1. Marine Debris Placards

The permit holders must post placards that include each of the information text boxes in Attachment 2 (Section A.2.4) of this Project Criteria in prominent places on all vessels, offshore training or orientation areas engaged in oil and gas operations in the Gulf of America OCS or where activity occurs. Each of the placards depicted, with the language specified, must be displayed on a 5x8 inch format or larger. One or more areas may be omitted if there is insufficient space. These notices must be referenced, and their contents explained, during any initial orientation given on the vessel. Placards must be sturdy enough to withstand the local environment and must be replaced when damage or wear compromises readability.

#### A.2.1.2 Marine Debris Training and Certification Process

All vessel operators, employees, and contractors performing OCS activities on behalf of the lessee must complete marine debris awareness training annually. The training consists of two parts:

1. viewing a marine debris training video or slide show (described below); and
2. receiving an explanation from management personnel that emphasizes their commitment to the requirements.

The marine debris training videos, training slide packs, and other marine debris related educational materials may be found at https://www.bsee.gov/debris and https://www.ooctraining.org/. The training videos, slides, and related material may be downloaded directly from the website.

Lessees engaged in oil and gas activities must continue to develop and use a marine debris awareness training and certification process that reasonably assures that they, and their respective employees, contractors, and subcontractors are, in fact, trained.

The training process must include the following elements:

1. A viewing of either the video or the slide show by the personnel specified above;
2. An explanation from the management that conveys the commitment of the company to achieve the objectives of the debris containment requirement;
3. Attendance measures (initial and annual); and
4. Recordkeeping and availability of records for inspection by BSEE.

**Training Report**: By January 31st of each year, the lessee must provide BSEE with an annual report (1–2 pages) signed by a company official that describes your marine debris awareness training process, number of people trained, estimated related costs, and certifies that the training process has been followed for the previous calendar year. You should send the report and any questions concerning compliance by email to marinedebris@bsee.gov. In lieu of emailing the report, you may send a printed copy to:

Bureau of Safety and Environmental Enforcement
Environmental Compliance Division - Gulf of America Section
1201 Elmwood Park Blvd.
New Orleans, Louisiana 70123

### A.2.3 Marine Debris Marking and Securing

**Marking**: Materials, equipment, tools, containers, and other items used in OCS activities which could be lost or discarded overboard must be clearly marked with the vessel or facility identification. All markings must clearly identify the owner and must be durable enough to resist the effects of the environmental conditions to which they may be exposed.

**Securing**: Materials, equipment, tools, containers, and other items used in OCS activities which could be lost or discarded overboard must be properly secured to prevent loss overboard.

1. Marine Debris Incidents

**Recovery**: Lessees must recover marine debris that is lost or discarded in the marine environment while performing OCS activities. If the marine debris is located within the boundaries of a potential archaeological resource and/or avoidance area, or a sensitive ecological and/or benthic resource area, the Lessee must contact BSEE for approval prior to conducting any recovery efforts that could impact the seafloor. The Lessee must enact steps throughout its OCS program to prevent similar incidents and must submit a description of these actions to BSEE in the Recovery Report below.

**48-Hour Report**: Lessees must submit a report to BSEE within 48 hours of a marine debris incident via marinedebris@bsee.gov. The "48-Hour Report" must describe recovery efforts or explain in detail if the Lessee determined that debris recovery is not warranted because (a) conditions are unsafe; (b) debris is insignificant and unrecoverable because it has floated away or sunk to the seafloor; or (c) debris is insignificant and immediate recovery is cost prohibitive. If conditions are unsafe, recovery must be attempted when conditions become safe. The Lessee must recover the marine debris lost or discarded if BSEE does not agree with the reasons provided by the Lessee to be relieved from the obligation to recover the marine debris. The 48-Hour Report must also include the following:

a) project identification and contact information for the lessee, operator, and/or contractor;
b) the date and time of the incident;
c) the lease number, OCS area and block, and coordinates of the object's location (latitude and longitude in decimal degrees);
d) a detailed description of the dropped object to include dimensions (approximate length, width, height, and weight), composition (e.g., plastic, aluminum, steel, wood, paper, hazardous substances, or defined pollutants), and whether it floats or sinks in seawater;
e) pictures, data imagery, data streams, and/or a schematic/illustration of the object, if available;
f) indication of whether the lost or discarded item could be a magnetic anomaly of greater than 50 nanotesla (nT), a seafloor target of greater than 0.5 m, or a sub-bottom anomaly of greater than 0.5m when operating a magnetometer or gradiometer, side scan sonar, or sub-bottom profiler in accordance with BOEM's and BSEE's applicable guidance;
g) an explanation of how the object was lost; and a description of immediate recovery efforts and results, including photos.

**Recovery Plan**: The Lessee must submit a "Recovery Plan" to BSEE via marinedebris@bsee.gov if marine debris is not recovered in 48 hours and BSEE determines that recovery is warranted. If BSEE does not object to an assertion in the 48-Hour Report that recovery is not warranted, then a Recovery Plan is not needed. The Recovery Plan must be submitted no later than 10 calendar days from the date in which the incident occurred and must detail a plan to recover the debris within 30 days from the date in which the incident occurred. Unless otherwise objected to by BSEE within 48 hours of the filing of the Recovery Plan, the Lessee can proceed with the activities described in the Recovery Plan.

The Lessee must request and obtain approval of a time extension if recovery activities cannot be completed within 30 days from the date in which the incident occurred.

**Recovery Report**: The Lessee must submit a "Recovery Report" to BSEE via marinedebris@bsee.gov within 10 calendar days from the date in which the recovery activities are completed. The Recovery Report must inform BSEE whether the debris has been recovered, a description of the recovery activities, and any substantial deviation from recovery activities as proposed in the Recovery Plan. The Lessee must describe steps enacted throughout all the Lessee's OCS leases to prevent similar incidents. If recovery was performed within 48 hours and described in the 48-Hour Report, or recovery is unwarranted, a Recovery Report is not required.

**Decommissioning Application**: Information on unrecovered marine debris must be included and addressed in the description of the site clearance activities provided in the decommissioning application required under 30 CFR § 285.906.

### A.2.2 Marine Debris Placards

**WHAT IS MARINE DEBRIS?**

Marine debris is any object or fragment of wood, metal, glass, rubber, plastic, cloth, paper or any other man-made item or material that is lost or discarded in the marine environment. Marine debris may be intentionally dumped, accidentally dropped, or indirectly deposited.

Whatever the source, marine debris is a direct result of human activities on land and at sea. Depending upon its composition, marine debris may sink to the seafloor, drift in the water column, or float on the surface of the sea. Certain debris, such as plastics, can persist for hundreds of years in the marine environment without decomposing.

**WARNING!**

**YOUR ACTIONS MAY SUBJECT YOU TO SEVERE LEGAL CONSEQUENCES!**

The disposal and/or discharge of any solid waste anywhere in the marine environment (other than ground-up food particles) is strictly prohibited by U.S. Coast Guard and Environmental Protection Agency regulations. THIS INCLUDES MATERIALS OR DEBRIS ACCIDENTALLY LOST OVERBOARD.

The disposal of equipment, cables, chains, containers, or other materials into offshore waters is prohibited by the Bureau of Safety and Environmental Enforcement (30 CFR 250.300(b)(6)). THIS INCLUDES MATERIALS OR DEBRIS ACCIDENTALLY LOST OVERBOARD.

**ATTENTION!**

**MARINE DEBRIS MAY CAUSE SEVERE ECOLOGICAL DAMAGE!**

Marine debris discarded or lost from offshore and coastal sources may injure or kill fish, marine mammals, sea turtles, seabirds, and other wildlife.

Thousands of marine animals, including marine mammals, sea turtles and seabirds, die every year from being entangled in fishing line, strapping bands, discarded ropes and nets and plastic six-pack rings. Additionally, unknown numbers of marine animals die each year from internal injury, intestinal blockage, and starvation as a result of ingesting marine debris.

Marine debris fouls boat propellers and clogs water intake ports on engines thereby endangering the safety of fishermen and boaters and resulting in heavy loss of time and money.

Marine debris detracts from the aesthetic quality of recreational beaches and shorelines and increases the cost of park and beach maintenance.

Attachment

**ATTENTION!**

**SECURE ALL LOOSE ARTICLES!**

NMFS now expects petroleum industry personnel to pick up and recover any articles lost overboard from boats and offshore structures as safety conditions permit. Additionally, 30 CFR 250.300(d) requires recording and reporting items lost overboard to the District Manager through facility daily operations reports.

Protect marine animals, as well as your valuable time and money, by doing the following to prevent accidental loss of these items:

Properly securing all materials, equipment, and personal belongings. Articles such as hardhats, life vests, sunglasses, cigarette lighters, parts bags, buckets, shrink wrap, strip lumber, and pipe thread protectors become marine debris when lost overboard.

Making sure that all trash receptacles have tight fitting lids and that the lids are used.

Providing and using secure cigarette butt containers. Cigarette butts are one of the most common forms of marine debris. Many cigarette butts contain some form of plastic and do not decompose in the ocean. Cigarette butts pose a major threat to marine wildlife as they resemble food and cause gut blockages and starvation when ingested.

Do your part to eliminate marine debris. Encourage others to be responsible about marine debris by making suggestions to secure potential marine debris on your boat or structure or by participating in a beach cleanup.

Attachment

# ATTACHMENT 3: THE BUREAUS' VESSEL STRIKE AVOIDANCE AND INJURED AND/OR DEAD AQUATIC PROTECTED SPECIES REPORTING PROJECT CRITERIA

## A.3 VESSEL STRIKE AVOIDANCE AND INJURED AND/OR DEAD AQUATIC PROTECTED SPECIES REPORTING PROJECT CRITERIA

These protocols (that are also considered project criteria because they were implemented as part of NMFS 2025 BiOp proposed action) will be required by BOEM, BSEE, and provide guidelines to operators in complying with OCSLA (43 U.S.C. §§ 1331 et seq.), ESA (16 U.S.C. §§ 1531-1544) and MMPA (16 U.S.C. §§1361- 1423h). The BOEM/BSEE proposed action under the 2025 NMFS BiOp includes robust avoidance or minimization measures (i.e., protocols), and those measures will continue to be implemented in the Gulf of America as project criteria under the 2026 Endangered Species Committee Order, as well as pursuant to the Bureaus' authority under OCSLA (43 U.S.C. §§ 1331 et seq.). The measures contained herein apply to all vessels associated with the federally regulated oil and gas program in the Gulf of America.

### A.3.1 Aquatic Protected Species Identification

Crew and supply vessel personnel should use a Gulf of America reference guide that includes identifying information on marine mammals, sea turtles, and other marine protected species (i.e., species that are not marine mammals and ESA- listed such as Gulf sturgeon, giant manta ray, or oceanic whitetip shark; hereafter collectively termed "other aquatic protected species") that may be encountered in the Gulf of America OCS or anywhere activity occurs. Vessel operators must comply with the below measures except under extraordinary circumstances when the **safety of the vessel or crew is in doubt or the safety of life at sea is in question**.

### A.3.2 Vessel strike avoidance

1. Vessel operators and crews must maintain a vigilant watch for all aquatic protected species and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any protected species. A single aquatic protected species at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures should always be exercised. A visual observer aboard the vessel must monitor a vessel strike avoidance zone (species-specific distances detailed below) around the vessel according to the parameters stated below, to ensure the potential for strike is minimized. Visual observers monitoring the vessel strike avoidance zone can be either third-party observers or crew members (e.g., captain), but crew members responsible for these duties must be provided sufficient training to distinguish aquatic protected species to broad taxonomic groups, as well as those specific species detailed further below.
2. Vessel speeds must also be reduced to 10 knots or less when mother-calf pairs, pods, or large assemblages (greater than three) of any marine mammal are observed near a vessel.
3. All vessels must maintain a minimum separation distance of 100 m from sperm whales, and 500 m from any baleen whale to specifically protect the Rice's whale. If the species is indistinguishable, then operators should assume it is a Rice's whale and act accordingly.
4. All vessels must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m from all "other aquatic protected species" including sea turtles and manatees, with an exception made for those animals that approach the vessel.
5. When aquatic protected species are sighted while a vessel is underway, the vessel should take action as necessary to avoid violating the relevant separation distance (e.g., attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If aquatic protected species are sighted within the relevant separation distance, the vessel should reduce speed and shift the engine to

neutral, not engaging the engines until animals are clear of the area. This does not apply to any vessel towing gear (e.g., source towed array and site clearance trawling).

6. All vessels 20 m (65 ft) or greater in support of oil and gas activities must have a functioning AIS onboard and operating at all times as required by the USCG. Even if the USCG does not require AIS for the vessel, it is strongly encouraged. At minimum, the reporting (as specified) must be followed and include trackline (e.g., time, location, and speed) data with Automatic Identification System (AIS) Maritime Mobile Service Identity (MMSI) numbers, if available.

The above requirements do not apply in any case where compliance would create an imminent and serious threat to a person or vessel or to the extent that a vessel is restricted in its ability to maneuver and, because of that restriction, is unable to comply.

### A.3.3 Injured and/or dead protected species reporting

At all times, vessel operators must report sightings of any injured or dead aquatic protected species as soon as possible but no greater than 24 hours, regardless of whether the injury or death was caused by the operator's vessel. If the injury or death was caused by a collision with the operator's vessel, the operator must immediately report the incident to the appropriate NMFS contact below for 24-hour response. The operator must further notify BOEM, BSEE, and NMFS immediately of the strike by email to protectedspecies@boem.gov, protectedspecies@bsee.gov and takereport.nmfsser@noaa.gov. The report must include the following information:

1. Name, telephone number, and email of company providing the report;
2. The vessel name at time of activity;
3. The lease number;
4. Time, date, and location (latitude and longitude [lat/long]) of the incident;
5. Species identification (if known) or description of the animal(s) involved;
6. Vessel's speed during and leading up to the incident;
7. Vessel's course/heading and what operations were being conducted (if applicable);
8. Status of all sound sources in use;
9. Description of avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike;
10. Environmental conditions (e.g., wind speed and direction, Beaufort Sea State, cloud cover, visibility) immediately preceding the strike;
11. Estimated size and length of animal that was struck;
12. Description of the behavior of the marine mammal immediately preceding and following the strike;
13. If available, description of the presence and behavior of any other marine mammals immediately preceding the strike;
14. Estimated fate of the animal (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared); and
15. To the extent practicable, photographs or video footage of the animal(s).

### A.3.4 Incidents requiring immediate reporting

Review of your proposed activities identified use of equipment that has the potential for entanglement and/or entrapment of protected species (i.e., species protected under the ESA and/or MMPA) that could be present during operations. In case of entrapment, procedures and measures for reporting are dependent upon the situation at hand.

Certain scenarios or incidents require immediate reporting to Federal agencies; these are described below. Should any of the following occur at any time, **immediate reporting** of the incident is required after personnel and/or diver safety is ensured:

- Entanglement or entrapment of a protected species (i.e., an animal is entangled in a line or cannot or does not leave a moon pool of its own volition).
- Injury of a protected species (e.g., the animal appears injured or lethargic).
- Interaction or contact with equipment by a protected species.
- Any observation of a leatherback sea turtle within a moon pool (regardless of whether it appears injured, or an interaction with equipment or entanglement and/or entrapment is observed).

As soon as personnel and/or diver safety is ensured, any of the incidents listed above must be reported to NMFS by contacting the appropriate expert for 24-hour response. If an immediate response is not received, the operator must keep trying until contact is made. Any failed attempts should be documented. Contact information for reporting is as follows:

- Marine mammals: contact WHALE HELPLINE at 877-942-5343.
- Sea turtles: contact NMFS Veterinary Medical Officer at 352-283-3370. If no answer, contact 301-310-3061. This includes the immediate reporting of any observation of a leatherback sea turtle within a moon pool.
- Other protected species (e.g., giant manta ray, oceanic whitetip shark, or Gulf sturgeon): contact the ESA Section 7 biologist at 301-427-8413 (nmfs.psoreview@noaa.gov) and report all incidents to takereport.nmfs@noaa.gov.

The report must include the following information:

1. Time, date, water depth and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
2. Name, type, and call sign of the vessel in which the event occurred;
3. Equipment being used at time of observation;
4. Species identification (if known) or description of the animal(s) involved;
5. Approximate size of animal;
6. Condition of the animal(s) during the event and any observed injury and/or behavior;
7. Photographs or video footage of the animal(s), if able; and
8. General narrative and timeline describing events that took place.

After the appropriate contact(s) have been made for guidance and/or assistance as described above, the operator may call BSEE at 985-722-7902 (24 hours/day) for questions or additional guidance on recovery assistance needs (if still required) and continued monitoring requirements. The operator may also contact this number if a timely response from the appropriate contact(s) listed above were not received. Minimum post-incident reporting includes all information described above in addition to the following:

9. NMFS liaison or stranding hotline that was contacted for assistance;
10. For moon pool observations or interactions:
11. Size and location of moon pool within vessel (e.g., hull door or no hull door);
12. Whether activities in the moon pool were halted or changed upon observation of the animal; and
13. Whether the animal remains in the pool at the time of the report, or if not, the time and date the animal was last observed.

Post-incident reporting should be made to BOEM/BSEE and NMFS (protectedspecies@boem.gov, protectedspecies@bsee.gov, takereport.nmfsser@noaa.gov).

# ATTACHMENT 4: THE BUREAUS' VESSEL TRANSIT WITHIN THE RICE'S WHALE AREA AS IDENTIFIED IN THE 2020 BIOLOGICAL OPINION'S REASONABLE AND PRUDENT ALTERNATIVE (2020 RWA)

*Revised Protocol A.6*

## A.6 VESSEL TRANSIT WITHIN THE RICE'S WHALE AREA AS IDENTIFIED IN THE 2020 BIOLOGICAL OPINION'S REASONABLE AND PRUDENT ALTERNATIVE (2020 RWA)

Operators or their recognized representative must follow requirements below as appropriate when transiting through the Rice's Whale Area as identified in the 2020 Biological Opinion's Reasonable and Prudent Alternative (2020 RWA; see figure below) when this transit is associated with either an initial plan/application or as part of a change to an existing plan/application when either vessel route and/or support base changes. The BOEM/BSEE proposed action under the 2025 NMFS BiOp includes robust avoidance or minimization measures (i.e., protocols), and those measures will continue to be implemented in the Gulf of America as project criteria under the 2026 Endangered Species Committee Order, as well as pursuant to the Bureaus' authority under OCSLA (43 U.S.C. §§ 1331 et seq.).

If transiting through any portion of the 2020 RWA, the BOEM Permit/Plan holder must submit a Post Transit Report upon completion to fulfil the reporting requirements as stated below to BOEM and BSEE (protectedspecies@boem.gov and protectedspecies@bsee.gov). Please be advised that changes to the use of a support base may trigger a revised plan (e.g., 30 CFR § 550.283), revised application, or modified permit (for geological and geophysical [G&G] activities). In the revised plan, application or permit, operators are required to follow the requirements defined in the NMFS 2025 BiOp proposed action, as required by the 2026 ESA Committee Order and the Bureaus' authority under OCSLA.

1. In the 2020 RWA, vessel operators and crews must maintain a vigilant watch for Rice's whales at all times and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any Rice's whale. Visual observers monitoring the 500 m vessel strike avoidance zone for Rice's whales can be either third- party observers or crew members (e.g., captain), but crew members responsible for these duties must be provided sufficient training to distinguish aquatic protected species to broad taxonomic groups, as well as those specific species detailed further below. If the species is indistinguishable, then operators should assume it is a Rice's whale and act accordingly (see below).

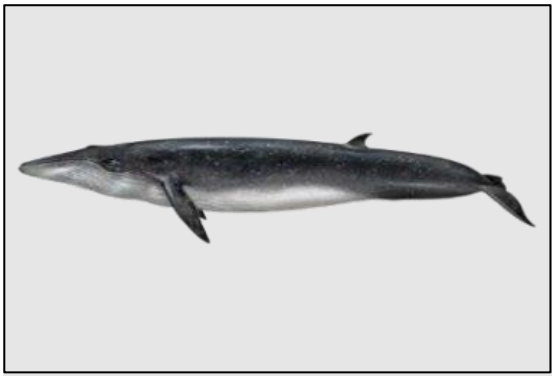

Figure depicting a Rice's whale

2. After completing transit through the 2020 RWA, you must prepare within seven (7) days a Post Transit Report describing the time the vessel entered and departed the 2020 RWA, any Rice's whale sightings or interactions (e.g., vessel avoidance) that occurred during transit, and any other marine mammal sightings or interactions. Post Transit

Reports must be submitted to protectedspecies@boem.gov and protectedspecies@bsee.gov. The subject line of the email should include "Post Transit Report through 2020 RWA". Minimum reporting information is described below:

a) The plan, permit or other BOEM or BSEE number used to identify the activity;
b) Port used for mobilization and demobilization;
c) Automatic Identification System (AIS) including Maritime Mobile Service Identity (MMSI) numbers, if available;
d) Time and date vessel entered and exited the 2020 RWA;
e) Time, date, water depth, and location (latitude/longitude) of the first sighting of the animal;
f) Name, type, and call sign of the vessel in which the sighting occurred;
g) Species identification (if known) or description of the animal involved;
h) Approximate size of animal (if known);
i) Condition of the animal during the event and any observed injury / behavior (if known);
j) Photographs or video footage of the animal, if available;
k) General narrative and timeline describing the events that took place;
l) Time and date vessel departed 2020 RWA;
m) Trackline (e.g., time, location, and speed) of vessel while within 2020 RWA; and
n) Environmental conditions, including Beaufort Sea State (BSS) and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon.

3. All vessels, regardless of size, must observe a 10-knot, year-round speed restriction in the 2020 RWA. The only exception to the 10-knot vessel speed restriction would be when observing the speed restriction would cause the safety of the vessel or crew to be in doubt or the safety of life at sea to be in question.
4. No transit is permissible through the 2020 RWA at nighttime or during low visibility conditions (e.g., BSS 4 or greater) except for emergencies (i.e., when the safety of the vessel or crew would otherwise be in doubt or the safety of life at sea is in question).
5. All vessels must maintain a minimum separation distance of 500 m from Rice's whales. If a whale is observed but cannot be confirmed as a species other than a Rice's whale, the vessel operator must assume that it is a Rice's whale and take appropriate action.
6. All vessels 65 feet (ft) or greater associated with oil and gas activity (e.g., source vessels, chase vessels, supply vessels) must have a functioning Automatic Identification System (AIS) onboard and operating at all times as required by the USCG. If the USCG does not require AIS for the vessel, it is strongly encouraged. At minimum, the reporting (as specified herein) must be followed and include trackline (e.g., time, location, and speed) data, with Automatic Identification System (AIS) Maritime Mobile Service Identity (MMSI) numbers, if available.
7. If an operator while operating within the 2020 RWA

a) exceeds the 10-knot vessel speed,
b) does not maintain a 500 m minimum separation distance from a Rice's whale, and/or
c) conducts transit in the 2020 RWA during nighttime or during low visibility conditions (e.g., BSS 4 or greater),

the operator must notify BSEE and BOEM by emailing protectedspecies@bsee.gov and protectedspecies@boem.gov within 24 hours. The notification must be reported as a separate and distinct notification to the Post Transit Report with the title "Transit Deviation through 2020 RWA" in the subject line. The notification must provide a detailed explanation as to why the transit deviation occurred.

8. This Protocol does not remove or alter the need to comply with any other applicable regulatory or legal requirements with respect to vessel operations, including as outlined in A3 - *Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Protocols*.

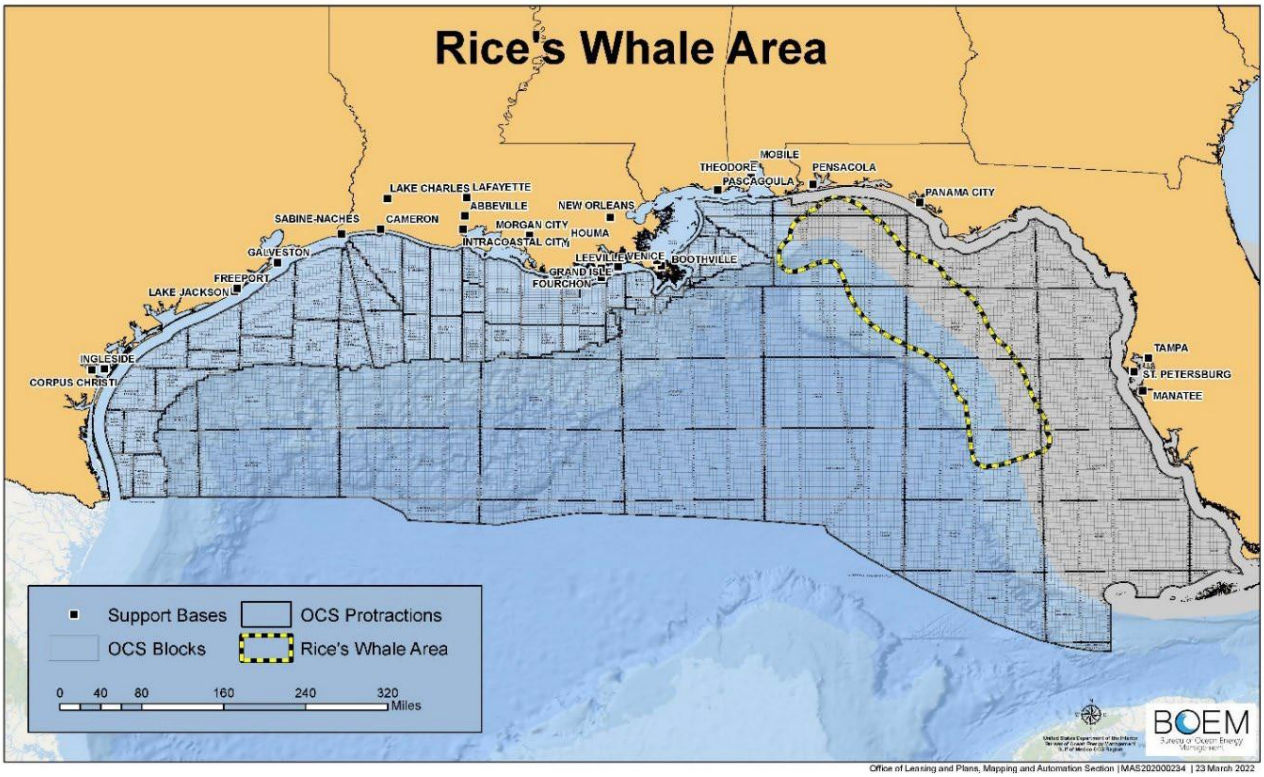


Figure depicting the 2020 RWA.

Attachme

# ATTACHMENT 5: THE BUREAUS' IN-WATER LINE PRECAUTION PROJECT CRITERIA

## A.4 IN-WATER LINE PRECAUTION PROJECT CRITERIA

The BOEM/BSEE proposed action under the 2025 NMFS BiOp includes robust avoidance or minimization measures (i.e., protocols), and those measures will continue to be implemented in the Gulf of America as project criteria under the 2026 Endangered Species Committee Order, as well as pursuant to the Bureaus' authority under OCSLA (43 U.S.C. §§ 1331 et seq.). If operations require the use of flexible, small diameter lines to support operations (with or without divers), operators and/or contractors must reduce the slack in the lines, except for human safety considerations, to prevent accidental entanglement of protected species (i.e., species protected under the ESA and/or MMPA). This requirement includes tether lines attached to remotely operated equipment. The requirements below must be followed for any activities entailing use of flexible, small diameter lines that will not remain continuously taut, except when complying with these requirements would put the safety of divers, crew, or the vessel at risk:

- Operators must use tensioning tools and/or other appropriate procedures to reduce unnecessary looseness in the lines and/or potential looping;
- The lines must remain taut, as long as additional safety risks are not created by this action;
- A line tender must be present at all times during dive operations and must monitor the line(s) the entire time a diver is in the water; and
- Should the line tender and/or diver become aware of an entanglement of an individual protected species, the reporting requirements described above (A.3.4) must be followed as soon as safety permits.

# ATTACHMENT 6: THE BUREAUS' MOON POOL MONITORING PROJECT CRITERIA

## A.5 MOON POOL MONITORING

The following protocol (which is known as Project Criteria based on its inclusion in the NMFS 2025 BiOp proposed action) would apply to all activities entailing use of the moon pool, except under circumstances when complying with these requirements would put the safety of the vessel or crew at risk. The BOEM/BSEE proposed action under the 2025 NMFS BiOp includes robust avoidance or minimization measures (i.e., protocols), and those measures will continue to be implemented in the Gulf of America as project criteria under the 2026 Endangered Species Committee Order, as well as pursuant to the Bureaus' authority under OCSLA (43 U.S.C. §§ 1331 et seq.). If any protected species (i.e., species protected under the ESA and/or the MMPA) is detected in the moon pool, you are required to follow the appropriate procedures described in *Reporting Requirements* below (see A.5.4).

Application of these measures includes, but is not limited to, dive support vessels, service vessels, pipelaying vessels, drillships, floating platforms (e.g., SPAR), mobile offshore drilling units, and other facilities with enclosed moon pools (e.g., well in the hull of a vessel, with or without a door).

### A.5.1 General requirements

Where the moon pools have hull doors, the operator(s) should keep the doors closed as much as reasonably practicable when no activity is occurring within the moon pool, unless the safety of crew or vessel require otherwise. This will prevent protected species from entering the confined area during periods of non-activity.

Use of a moon pool requires regular monitoring while open to the water column and if a vessel is not underway. Regular monitoring means 24-hour video monitoring with hourly recurring checks for at least five minutes of the video feed, or hourly recurring visual checks of the moon pool for at least five minutes by a dedicated crew observer with no other tasks during that short visual check.

If water conditions are such that observers are unable to see within a meter of the surface, operations requiring the lowering or retrieval of equipment through the moon pool must be conducted at a rate that will minimize potential harm to protected species.

### A.5.2 Closure of the hull door

- Should the moon pool have a hull door that can be closed, then before and after closure, the moon pool must be monitored continuously by a dedicated crew observer with no other tasks to ensure that no individual protected species is present in the moon pool area. If visibility is not clear to the hull door from above (e.g., turbidity or low light), 30 minutes of monitoring is required before hull door closure.
- If a protected species is observed in the moon pool before the closure of the hull door, the hull door must not be closed, except for human safety considerations. Once the observed animal leaves the moon pool, the operator may commence closure. If the observed animal remains in the moon pool, contact NMFS or BSEE before the closure of the hull doors according to reporting requirements (see Reporting Requirements under Reporting of Observations of Protected Species within an Enclosed Moon Pool).

### A.5.3 Movement of the vessel (no hull door) and equipment deployment and/or retrieval

- Before movement of the vessel and/or the deployment and/or retrieval of equipment, the moon pool must be monitored continuously for a minimum of 30 minutes, by a dedicated crew observer with no other tasks, to ensure no individual protected species is present in the moon pool area.
- If a protected species is observed in the moon pool before movement of the vessel, the vessel

must not be moved and equipment must not be deployed or retrieved, except for human safety considerations. If the observed animal leaves the moon pool, the operator may commence activities. If the observed animal remains in the moon pool, contact BSEE before planned movement of the vessel according to reporting requirements (see Reporting Requirements under Reporting of Observations of Protected Species within an Enclosed Moon Pool).

- Should a protected species be observed in a moon pool before activity commences (including lowering or retrieval of equipment), recovery of the animal or other actions specific to the scenario may be required from NMFS to prevent interaction with the animal. If protected species are observed during activity, only reporting is required. Operators must not take such action except at the direction of, and after contact with, NMFS.

### A.5.4 Reporting requirements

#### A.2.2.1 Reporting of Observations of Protected Species within an Enclosed Moon Pool

If a protected species is observed within an enclosed moon pool and does not demonstrate any signs of distress or injury or an inability to leave the moon pool of its own volition, measures described in this section must be followed (only in cases where they do not jeopardize human safety). Although this particular situation may not require immediate assistance and reporting as described under *Incidents Requiring Immediate Reporting* (see Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Protocol; A.3.4), a protected species could potentially become disoriented with their surroundings and may not be able to leave the enclosed moon pool of their own volition. In order for operations requiring use of a moon pool to continue, the following reporting measures must be followed.

After 24 hours of any observation, and daily after that for as long as an individual protected species remains within a moon pool (i.e., in cases where an ESA-listed species has entered a moon pool but entrapment or injury has not been observed), the following information must be reported to BOEM and BSEE (protectedspecies@boem.gov, protectedspecies@bsee.gov):

1. For an initial report, the information should include:
   a) Time, date, water depth and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
   b) Name, type, and call sign of the vessel in which the event occurred;
   c) Equipment being utilized at time of observation;
   d) Species identification (if known) or description of the animal(s) involved;
   e) Approximate size of animal;
   f) Condition of the animal(s) during the event and any observed injury / behavior;
   g) photographs or video footage of the animal(s), if able; and
   h) General narrative and timeline describing events that took place.
2. For subsequent daily reports:
   a) Describe the animal's status to include external body condition (e.g., note any injuries or noticeable features), behaviors (e.g., floating at surface, chasing fish, diving, lethargic, etc.), and movement (e.g., has the animal left the moon pool and returned on multiple occasions?);
   b) Description of current moon pool activities, if the animal is in the moon pool;
   c) Description of planned activities in the immediate future related to vessel movement or deployment of equipment;
   d) Any additional photographs or video footage of the animal, if possible;

e) Guidance received and followed from NMFS liaison or stranding hotline that was contacted for assistance;
f) Whether activities in the moon pool were halted or changed upon observation of the animal; and
g) Whether the animal remains in the pool at the time of the report, or if not, the time and date the animal was last observed.

# ATTACHMENT 7: THE BUREAUS' PILE DRIVING PROJECT CRITERIA

## A.9 Pile Driving Monitoring and Reporting Requirements Project Criteria

This Protocol (also considered a Project Criteria because of its inclusion in NMFS 2025 BiOp proposed action) will be implemented by BSEE, BOEM, and provide requirements to operators in complying with the Outer Continental Shelf Lands Act (OCSLA; 43 U.S.C. §§ 1331 et seq.) and the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544). The BOEM/BSEE proposed action under the 2025 NMFS BiOp includes robust avoidance or minimization measures (i.e., protocols), and those measures will continue to be implemented in the Gulf of America as project criteria under the 2026 Endangered Species Committee Order, as well as pursuant to the Bureaus' authority under OCSLA (43 U.S.C. §§ 1331 et seq.). These measures contained herein apply to impact of pile driving activities (i.e., stationary activity) in water less than 100 meters approved by BOEM and/or BSEE and associated with the Federally regulated oil and gas program in the Gulf of America. Impact pile driving in depths greater than 100 meters or use of other pile driving types (e.g., vibratory) may require supplemental mitigations to those in this protocol and will be determined on a case-by-case basis.

### A.9.1 Background

Pile driving (e.g., impact hammer) activities may have an impact on marine wildlife. Many marine species are protected under the ESA and all marine mammals (including manatees) are protected under the MMPA. Table 9 provides the Gulf of America species listed under the ESA:

**Table 9. Gulf of America Species Listed Under the ESA**

| Species |
|---|
| Rice's whale (*Balaenoptera ricei*) |
| Sperm whale (*Physeter macrocephalus*) |
| Green turtle (*Chelonia mydas*) – North Atlantic DPS and South Atlantic DPS |
| Hawksbill turtle (*Eretmochelys imbricata*) |
| Kemp's ridley turtle (*Lepidochelys kempii*) |
| Leatherback turtle (*Dermochelys coriacea*) - Northwest Atlantic DPS |
| Loggerhead turtle (*Caretta caretta*) – Northwest Atlantic Ocean DPS |
| Gulf sturgeon (*Acipenser oxyrinchus desotoi*) |
| Oceanic whitetip shark (*Carcharhinus longimanus*) |
| Giant manta ray (*Manta birostris*) |
| West Indian manatee (*Trichechus manatus*)* |

*Managed by the USFWS

Note that this list can change as other species are listed/delisted, and this project criteria must be applied to any ESA-listed species (and all marine mammals) that occur in the Gulf of America, including rare and extralimital species, such as blue whales (*Balaenoptera musculus*).

This Protocol is the result of coordination between BOEM, BSEE, NMFS, and industry and is based on measures and mitigations included in the proposed action for the NMFS 2025 BiOp, in accordance with the 2026 Endangered Species Committee order, as well as pursuant to the Bureaus' authority under OCSLA. BSEE is tasked as the lead agency for compiling lessee or operator reporting data applicable to both Bureaus outlined in the proposed action of NMFS 2025 BiOp. Therefore, all data collection reports described herein must be submitted to BSEE. Some other reporting requirements may also include BOEM and NMFS where specified below.

In order to protect ESA-listed species and marine mammals during pile driving operations, operators will be required to follow specific protocols when operating. Suction piles do not require said protocols. Operators must comply with the below measures except under extraordinary circumstances when the **safety of the vessel or crew is in doubt or the safety of life at sea is in question**.

### A.9.2 Definitions

Terms used in this Protocol have the following meanings:

1. **Protected species** means any species listed under the ESA and/or protected by the MMPA. Requirements discussed herein focus on marine mammals and sea turtles since these species are the most likely to be observed during pile driving activities. However, other ESA-listed species (e.g., giant manta rays) are also protected and observations of them should be reported as detailed below in Reporting Requirements.
2. **Pile driving activity** means stationary activities that utilize an impact hammer for the setting of foundations for but not limited to Caisson Structures, Fixed Platforms, Tension Leg Platforms, and shallow water conductors as approved in a permit or plan.
3. **Soft start (sometimes referred to as "ramp-up")** means the gradual and systematic increase of emitted sound levels from a pile driving activity. The use of a soft start procedure is believed to provide additional protection to protected species by "warning" and/or providing them a chance to leave the area prior to full operation.
4. **Operational level** means the highest energy level at which the pile driving activity will operate for the majority of the time. The strikes from the impact hammer at operational level will be at a higher energy level than the initial strikes during soft start, if possible.
5. **Shutdown zone (formerly exclusion zone)** means the area to be monitored for pre-clearance and possible mitigation actions (such as delays to soft start or shutdowns) in order to reduce or eliminate the potential for injury of protected species. The shutdown zone encompasses the area at and below the sea surface from the edges of the pile driving activity out to a radius of 500 ft (152 m) upon detection of protected species within or entering that zone.
6. **Pre-clearance** means the visual monitoring of the shutdown zone for protected species to determine if the zone has been clear of protected species for at least 30 minutes before the soft start may begin. If a protected species is observed entering or within the shutdown zone prior to the initiation of impact pile driving activities, pile driving must be delayed and will not begin until either the protected species has voluntarily left the shutdown zone or when specific time periods have elapsed with no further sightings have occurred (i.e., 30 minutes). Visual monitoring should extend beyond the shutdown zone for detecting protected species that may be traveling to or entering the shutdown zone.
7. **Shutdown** means the immediate cessation of pile driving activity when technically feasible, as described below in General Requirements. This does not include cessation of pile driving at full operational level that may result in pile instability or refusal, or human safety concerns.
8. **Visual monitoring** is intended to establish and maintain (when visual conditions allow) a zone around the pile driving activity that is clear of protected species, thereby reducing or eliminating the potential for auditory injury before operational level is achieved. Visual monitoring of the full extent of adjacent waters is intended to aid in establishing and maintaining the shutdown zone by alerting all relevant personnel of protected species that are outside of, but may approach and enter, the shutdown zone.

### A.9.3 General requirements

1. A copy of this Project Criteria must be in the possession of the operator, other relevant personnel, the observer(s), and any other relevant designees operating under the authority of the approved Permit and/or Plan.
2. Monitoring must be conducted by qualified, NMFS-approved observers, which can include crew members, in accordance with the following conditions:
    a. Observers must be dedicated, NMFS-approved (in advance of the activity; see Visual Observer(s) Qualifications) and have no other assigned tasks during monitoring periods. For visual monitoring, at a minimum one individual must be designated with all the authority and appropriate qualifications to conduct protected species monitoring and shutdown requests, as needed. Crew members responsible for these duties must be provided sufficient training to distinguish aquatic protected species to broad taxonomic groups, as well as those ESA-listed species detailed above.
    b. A minimum of one designated NMFS-approved observer must be on duty during the required monitoring period (30 minutes before piling is initiated to 30 minutes after piling is complete) and have no tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant crew with regard to the presence of protected species and mitigation requirements (including brief alerts regarding maritime hazards).
    c. At least one experienced (or "lead") observer on a project must have prior experience performing the duties of an observer during pile driving activity. This observer must have sufficient experience in monitoring and mitigation with pile driving and can work independently on a project.
    d. Additional observer(s) may substitute other relevant experience, education (degree in biological science or related field), or training for prior experience performing the duties of an observer during pile driving activity. Additional observer(s) need(s) to gain experience on a pile driving project by training alongside an experienced observer for at least one shift before working independently. This training must include monitoring, collecting data, and communicating with and instructing relevant crew with regard to the presence of protected species and mitigation requirements. This training shift should be a 'dry run' completed prior to the required monitoring period during pile driving operations, when feasible.
    e. The operator must ensure relevant personnel (including but not limited to applicable rig and platform personnel) are notified of the observers' authority with regard to the measures described in this Protocol. Designated observers must participate in all pre-operation briefings (job safety analysis [JSA] / job safety and environmental analysis [JSEA] meetings) to ensure that responsibilities, communication procedures, protected species monitoring protocols, operational procedures, and permit requirements are clearly understood. This briefing procedure must be repeated at each shift change and JSA/JSEA meeting, and before work commences or recommences.
3. The observer(s) must be granted access to relevant instrumentation to document real-time log information.
4. The observer(s) must be granted access to the most appropriate observation posts to safely conduct visual monitoring of the shutdown zone. The observation posts should provide an unobstructed view of the entire shutdown zone and adjacent waters to the maximum extent practicable.

5. Monitoring by observer(s) must take place from 30 minutes prior to initiation of pile driving activity (i.e., pre-clearance monitoring before soft start) through 30 minutes post-completion of pile driving activity.
6. Pile driving may commence only during daylight hours (i.e., between dawn/dusk for visual monitoring) and during good visibility (i.e. when full shutdown zone is visible, as determined by the lead observer), unless the field engineer, or other qualified personal, determine that delaying pile driving until daylight hours has the potential to result in pile instability or refusal, or human safety concerns. In order for pile driving to commence outside of daylight hours, observer(s) must be equipped with alternative monitoring equipment (e.g. night vision, thermal cameras, etc.) that ensures the shutdown zone can be adequately monitored.
7. Pile driving may not continue during low visibility (i.e., when weather and/or nighttime prevent monitoring of the entire shutdown zone without use of alternative monitoring equipment) unless the field engineer, or other qualified personnel, determine that delaying pile driving until adequate visibility has the potential to result in pile instability or refusal, or human safety concerns. In order for pile driving to continue during low visibility, observer(s) must be equipped with alternative monitoring equipment (e.g. night vision, thermal cameras, etc.) that ensures the shutdown zone can be adequately monitored.
8. Observers must be able to identify and document behaviors of protected species at this distance (and preferably beyond) for implementation of mitigation measures described herein. If pile driving activity is intended to occur during nighttime hours, initiate soft start during daylight hours so that pre-clearance checks can be effective or use low light alternative monitoring equipment.
9. Soft start procedures are required at the beginning of the activity and at any time following a cessation of pile driving activity of more than 30 minutes.
10. If a protected species is observed within or entering the shutdown zone, the observer must call for a shutdown of activity by communicating such to the field engineer, or other qualified personnel.
    a. The field engineer, or other qualified personnel, will determine if a shutdown is technically feasible and inform the observer if they can, or cannot, implement a shutdown. A shutdown would not be considered technically feasible if it has the potential to result in pile instability or refusal, or human safety concerns. If shutdown cannot safely occur, the hammer, if safe to do so, should be reduced in energy to the lowest practical level. If not technically feasible, then the operator/engineer must provide the reasoning details to the observer for reporting.
    b. The field engineer/qualified personnel must closely monitor tubular penetration, soil data, real-time hammer log information, and any other relevant information needed to determine if a cessation of activity is technically feasible to ensure a timely response to any call for a shutdown by an observer.

### A.9.4 Visual observers

#### A.9.1.1 Qualifications

Operator must use a dedicated, NMFS-approved observer(s). A minimum of one designated NMFS-approved observer must be on duty during the required monitoring period (30 minutes before piling is initiated to 30 minutes after piling is complete) and have no tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant crew with regard to the presence of protected species and mitigation requirements (including brief alerts regarding maritime hazards). To become a NMFS-approved observer specific to oil and gas related pile driving, an individual submits qualifications/credentials to NMFS at nmfs.psoreview@noaa.gov with subject line "Gulf of America pile driving observer". Training and experience provided in a resume/CV must be sufficient to perform necessary tasks of species identification, safety, communication and data collection/reporting. However, if already NMFS- approved as a protected species observer for geophysical surveys in the U.S., then that would qualify an individual to act in this role, and their name(s) and approval dates would be submitted to the email above for project-specific notification/approval.

#### A.9.1.2 Equipment

The BSEE- or BOEM-approved Permit and/or Plan holder is required to work with the relevant personnel to ensure that the observer has all equipment needed to adequately perform necessary tasks, including accurate determination of distance and bearing to observed protected species. Such equipment should include but is not limited to:

a. Reticle binoculars (e.g., 7 x 50) of appropriate quality (plus backup);
b. Digital single lens reflex (SLR) camera with a telephoto lens;
c. Radios for communication among rig/platform crew and observer (plus backups);
d. Any other tools necessary to adequately perform necessary observer tasks; and
e. Low light alternative monitoring equipment (e.g., night vision, thermal cameras, etc.)

The Permit and/or Plan holder is responsible for ensuring the observer has the proper equipment specified in (a) through (d) above required to perform the duties specified within this Protocol.

#### A.9.1.3 Visual monitoring

An observer schedule showing that the number of observer(s) used is sufficient to effectively monitor the area for the project and record the required data must be included. The observer must not be on watch for more than 4 consecutive hours, with at least a 1-hour break after a 4-hour watch. The observer must not be on active duty observing for more than 12 hours in any 24-hour period during multiple-day operations, if applicable.

1. Observer(s) must monitor from 30 minutes prior to initiation of pile driving activity (i.e., pre-clearance monitoring before soft start) through 30 minutes post-completion of pile driving activity. Observer(s) must record all protected species detections, regardless of distance from the pile driving activity, and must document detection distance and any behavioral reactions.
2. Observer(s) must be located at the best vantage point(s) in order to ensure 360° visual coverage around the activity and must conduct visual observations using the camera, binoculars, and the naked eye while free from distractions and in a consistent, systematic, and diligent manner, while still maintaining a safe work environment. If possible, the observer should photograph any detected protected species for Data Collection and Reporting Requirements.

3. Observer(s) must establish and monitor the shutdown zone or activities cease, whichever comes first. This zone must be based upon the radial distance from the pile that will be driven. Detections of protected species that are seen outside the shutdown zone and in adjacent waters should be communicated to the operator to prepare for the potential shutdown of the activity.
4. Any observations of protected species by crew members aboard any vessel or platform associated with the pile driving activity must be relayed to the observer immediately.

### A.9.1.4 Pre-clearance and soft start

The intent of pre-clearance observation (30 minutes) is to ensure no protected species are observed within or entering the shutdown zone prior to the beginning of soft start. The intent of soft start is to warn protected species of pending pile driving activities and to allow sufficient time for those animals to leave the immediate vicinity. A soft start procedure, involving an initial set of strikes at a reduced energy level, is required at the beginning of each day's pile driving activity and at any time following a cessation of activity of more than 30 minutes. If this cessation of activity occurs, then an operator must wait to conduct pre-clearance and soft start for the next round of activity. All operators must adhere to the following pre-clearance and soft start requirements:

1. The observer on duty has the authority to delay the beginning of soft start procedures or to call for shutdown (see Shutdown) of activity if a protected species is detected within the shutdown zone.
2. The operator must notify the designated observer of the planned start of soft start as agreed upon with the observer; the notification time should not be less than 60 minutes prior to the planned soft start in order to allow the observer time to monitor the shutdown zone for 30 minutes prior to the initiation of soft start (pre-clearance).
3. The observer conducting pre-clearance observations must be notified again immediately prior to initiating soft start procedures and the operator must receive confirmation from the observer to proceed.
4. Soft start may not be initiated if any protected species is observed within the shutdown zone. If a protected species is observed within the shutdown zone during the 30-minute pre-clearance period, soft start may not begin until the animal(s) has been observed exiting the shutdown zone or until an additional time period of 30 minutes has elapsed with no further sightings.
5. If the activity is shut down for brief periods (i.e., less than 30 minutes) for reasons other than that described below in Shutdown (e.g., mechanical difficulty), it may be activated again without soft start procedures if the observer has maintained constant visual observation and no detections of protected species have occurred within the shutdown zone.
6. If cessation of the activity is longer than 30 minutes, soft start procedures must be utilized if the field engineer, or other qualified personnel, determines it is technically feasible.
7. Soft start must begin by activating the hammer at a reduced energy level for the initial strikes and must continue by increasing the energy level in stages as determined by the field engineer. The operator must provide information to the observer documenting that appropriate procedures were followed. An example scenario for soft start:

- Soft start procedure: A soft start must be implemented at the start of each impact pile driving operation, any time pile driving has been shutdown or delayed due the presence of a listed species, and following cessation of pile driving for a period of 30 minutes or longer. Hammer operators must begin with an initial set of strikes at no more than half the operational power, followed by a 30 second waiting period, then a second set of reduced power strike followed by another 30 second waiting period. Following this soft start procedure, operational impact pile driving may commence and continue provided listed species remain absent from the shutdown zone.

### A.9.1.5 Shutdown

The Permit and/or Plan holder must adhere to the following shutdown requirements:

1. The observer must monitor the shutdown zone and adjacent waters during soft start and operations. If a protected species is observed within or entering the shutdown zone, the observer must call for a shutdown, after which the field engineer or other qualified personnel determines whether a shutdown is technically feasible (see General Requirements). If the field engineer, or other qualified personnel, determines a shutdown can be implemented, the activity must be halted immediately by cessation of strikes.
2. If determined by the field engineer, or other qualified personnel, to be not feasible (e.g., pile damage or hammer pile alignment), the operator or field engineer will provide the observer details for why it is not feasible, and this information must be included in the comprehensive report.
3. Upon implementation of shutdown, the activity may recommence after the protected species has been observed exiting the shutdown zone, or if 30 minutes have elapsed since the last observation and no other protected species were observed in the shutdown zone. Soft start procedures must be utilized after implementation of a shutdown.
4. The operator must establish and maintain clear lines of communication directly between the observer on duty and relevant crew operating the pile driver to ensure that shutdowns are conveyed swiftly while allowing the observer(s) to maintain watch.

### A.9.5 Data collection

The observer must use data collection forms, whether hard copy or electronic. Observer must record detailed information about any implementation of mitigation requirements, including the distance of animals to the pile driving activity and description of specific actions that ensued, the behavior of the animal(s), any observed changes in behavior before and after implementation of mitigation, if shutdown was implemented, and the length of time before any subsequent soft start of the pile driving activity. If required mitigation was not implemented, observer should record a description of the circumstances. At a minimum, the following information must be recorded:

1. Operator name and facility information;
2. Observer names and affiliations/company;
3. Date and participants of observer briefings (as discussed in General Requirements) or a copy of the signed JSA(s)/JSEA(s);
4. Observation shifts/times;
5. Observer monitoring location;
6. Date and time monitored pile driving activity begins or ends;
7. Environmental conditions during monitoring periods (at beginning and end of visual observer shift and whenever conditions change significantly, including BSS, cloud cover, fog, sun glare, overall visibility and estimated observable distance), noting time when change occurs;

8. Factors that may have contributed to impaired observations (e.g., vessel traffic obstructing views);
9. Upon visual observation of any protected species, the following information:
    a) Watch status (sighting made by observer during watch, by personnel or crew, etc.);
    b) Date and time of observation;
    c) Location of observation (Lat/Long coordinates);
    d) Distance of the animal from visual observer and/or construction activity (feet or meters, please specify);
    e) Pile driving activities occurring during observation;
    f) Species, numbers, and, if possible, size, sex and age class;
    g) Description of any observable behavior patterns (e.g., feeding, traveling, etc.), including bearing and direction of travel and distance from activity; and
    h) Description of implementation of mitigation measures (e.g., delay or shutdown) including detailed circumstances and reasoning for any shutdown that could not be implemented and the specifics of the pile driving activity at that time.

10. Pile driving logs and/or activity information, such as energy output of hammer while in operation (e.g., amount of "reduced energy output" during soft start and amount of "full energy output" after completion of soft start and up to operational energy level), number of strikes per pile, pile size and any other notes of significance (i.e., pre-clearance, soft start, shutdown, operational energy level, end of operations, etc.). Specific minimal requirements for logs are further outlined here:

a. Operator
b. OCS Lease
c. Area Block
d. Well Name/Structure Name
e. API/Complex ID
f. Plan number (EP, DOCD)
g. Start Date
h. Completion Date (e.g., total duration of activity for which actively hammering)
i. Type of Impact Hammer Used (impact)
j. Drive Pipe / Pile diameter, (in)
k. Drive Depth, (ft)
l. Drive Depth BML, (ft)
m. Water Depth (ft)
n. Substrate Type(s) (e.g., silt, mud, sand, gravel, etc.)
o. Type of Pile Driven (e.g., drive pipe or conductor, piling, etc.)
p. Pile Material (e.g., steel, concrete, etc.)
q. Number of piles driven
r. Number of strikes per pile
s. Total number of strikes
t. Whether hammer is operating (dry) or below (wet) the water surface
u. Number of Soft Starts
v. Duration of Soft Starts (mins)
w. Duration at Full/Operating Power (HH:MM)
x. Hammer low energy output (KIP or kJ)
y. Duration at low energy (HH:MM)
z. Hammer highest energy output (KIP or kJ)
aa. Duration at highest energy levels (HH:MM)
bb. Number of hammer pauses
cc. Total duration of pauses (HH:MM)

### A.9.6 Reporting requirements

1. The Permit and/or Plan holder, or observer on behalf of your company, must submit data collection reports (see Data Collection for details) to BSEE (protectedspecies@bsee.gov) detailing all protected species observations within 15 days of completing operations. BSEE is tasked as the lead agency and will submit reports to other agencies as appropriate.
2. The Permit and/or Plan holder, or observer on behalf of your company, must submit a comprehensive report to BSEE (protectedspecies@bsee.gov) and BOEM (protectedspecies@boem.gov) on all pile driving activities and monitoring results within 30 days of completing operations. This comprehensive report will utilize the information from the data collection reports to provide full documentation of methods, results, and interpretation pertaining to all monitoring, and must summarize the dates of the pile driving activities conducted and all protected species observations.
3. If a Rice's whale, or what is presumed to be Rice's whale, is observed at any time by visual observer(s) or construction personnel, the Permit and/or Plan holder must immediately report the sighting information to NMFS via nmfs.psoreview@noaa.gov as soon as feasible but no longer than 24 hours after the sighting. Information must include at minimum: time of sighting, location, and number of Rice's whales observed. Please also include images or any other relevant information. For other applicable information, see Data Collection (A.9.5). The subject line for the information must include for tracking purposes: Gulf of America presumed Rice's whale observation and "date".
4. Dead and Injured species reporting:
    - For injured or dead non-marine mammal aquatic protected species, report incidents to the hotlines listed at https://www.fisheries.noaa.gov/report (phone numbers vary by state). For reporting dead or injured marine mammals, refer to Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Protocol.
    - Marine mammals: contact WHALE HELPLINE at 877-942-5343.

# ATTACHMENT 8: THE BUREAUS' EXPLOSIVE-SEVERANCE SCENARIO PROJECT CRITERIA

## A.8 EXPLOSIVE-SEVERANCE SCENARIO PROJECT CRITERIA PACKAGE

The BOEM/BSEE proposed action under the 2025 NMFS BiOp includes robust avoidance or minimization measures (i.e., protocols), and those measures will continue to be implemented in the Gulf of America as project criteria under the 2026 Endangered Species Committee Order, as well as pursuant to the Bureaus' authority under OCSLA (43 U.S.C. §§ 1331 et seq.).

### A.8.1 *Sargassum* habitat monitoring

"*Sargassum* habitat" is defined as the presence of *Sargassum* in sufficient amounts that serve as developmental habitat in which small juvenile sea turtles are likely to be found. Small juvenile turtles are extremely difficult to detect and *Sargassum* habitat will be used as the primary indicator of their presence in an impact zone. Typically, the occasional presence of a few, small *Sargassum* "clumps" are not considered developmental habitat. *Sargassum* habitat for sea turtles is visually described as mats, continuous lines, broken windrows (short lines or non-linear clumps), or scattered patches (Table 4). NMFS PSOs will be required to monitor local conditions to determine if *Sargassum* habitat is present based on the hourly conditions at a decommissioning site and implement the appropriate measures in Tables 6a and 6b.

**Table 4. Description of Sea Turtle Sargassum Habitat Types**

| *Sargassum* Habitat Type | Description |
|---|---|
| Mat | One or more consolidated areas of Sargassum forming a mat large enough to provide shelter and/or food for a small sea turtle. |
| Continuous Line | One or more contiguous meandering lines or scattered patches along a linear path. Lines may be narrow or wide. These lines are often associated with convergence zones. |
| Broken Windrows | Many parallel, short lines or clumps that may or may not be distributed linearly. |
| Scattered Patches | Numerous patches scattered over an area. |

Witherington et al., 2012

### A.8.2 Requirements for establishing impact zones

a) Impact zones in both shallow and deep water are determined by the net explosive weights used during a decommissioning event. The impact distance(s) must be based on the largest charge size proposed to be used during a removal event when multiple charges are used. The measures herein apply to any charge size up to 500 pounds (lb). The charge weight establishes the specific mitigation scenario that must be adhered to as a permit condition.

b) Impact zones for each scenario must be calculated using the most recent version of the Underwater Calculator (UWC) that has been reviewed and approved by NMFS. The current required impact zones (Table 5) are based on UWC version 1.5.3 that is the latest approved version at the time of this opinion. Review and approval of UWC revisions will be completed according to the second tier consultation procedures.

**Table 5. Impact zones for net explosive weights based on underwater calculator version 1.5.3**

| Net Explosive Weight (lb) | Impact Zone Distance BLM | Impact Zone Distance AML |
|---|---|---|
| 1–10 | 261 m (856 ft) | 293 m (961 ft) |
| >10–20 | 373 m (1,224 ft) | 522 m (1,714 ft) |
| >20–80 | 631 m (2,069 ft) | 829 m (2,721 ft) |
| >80–200 | 941 m (3,086 ft) | 1,126 m (3,693 ft) |

| Net Explosive Weight (lb) | Impact Zone Distance BLM | Impact Zone Distance AML |
|---|---|---|
| >200–500 | 1,500 m (4,916 ft) | 1,528 m (5,012 ft) |

c) NMFS understands all decisions on explosive composition, configuration, and usage need to be made by the qualified explosive contractors in accordance with the applicable explosive-related laws and regulations. BSEE or their permittee must provide a written blasting plan to the PROP Program Manager prior to the anticipated blasting date. The blasting plan must include the number of and type of structures, number of decommissioning events, type of explosives, and weight of explosives. Any changes to the net explosive weights detailed in the blasting plan must be submitted in writing to the Platform Removal Observer Program (PROP) program manager or lead PSO on site. The PROP Program Manager or lead PSO will determine the appropriate scenario measure (described below) and impact zone required based on the final net explosive weights used for the removal.

d) PSOs may use binoculars and the naked eye to monitor the zones. The sighting distance of all listed species and Sargassum habitat that result in delays must be recorded.

e) Buoys or some visible markers will be necessary for visual reference of the impact zone when only surface monitoring is required. The perimeter of impact zones should be demarcated (e.g., brightly colored buoys, vessels, or other markers) for visual reference.

f) If any ESA-listed species, or Sargassum habitat indicative of small juvenile sea turtles are present in the impact zone, a detonation must not proceed. Steps for tracking animals, inspecting Sargassum habitat, delay periods, and additional monitoring are detailed below.

### A.8.3 Requirements for differing scenario mitigations

a) Permittees must fully comply with the relevant measures according to impact zones in Table 5 and the mitigation scenarios in Table 6. Table 5 provides the impact zone distances required based on the net explosive weight used. Table 6 summarizes the required mitigation and monitoring surveys, and duration of monitoring required. Sea turtles can remain submerged on a single dive for well over 30 minutes, hence the reason for increasing the pre-detonation aerial survey to 45 minutes (Byles, 1989; Renaud, 1995; Gitschlag, 1996).

**Table 6a. Mitigation overview for net explosive weights used in any configuration in shallow water (SW; less than 200 m)**

| Mitigation Scenario Number | Net Explosive Weight (lb) | Pre-Det Surface Survey (min) | Pre-Det Aerial Survey (min) | Pre-Det PAM (min) | Animal Sightings Waiting Period (min) | Sargassum Habitat Waiting Period | Post-Det Surface Survey (min) | Post-Det Aerial Survey (min) | Post-Post-Det Aerial Survey within One Week |
|---|---|---|---|---|---|---|---|---|---|
| SW-1 | 1–10 | 60 | N/A | N/A | 30 | Until visually inspected or Sargassum floats out of Impact Zone | 30 | N/A | No |
| SW-2 | >10–20 | 90 | 45 | N/A | 30 | Until visually inspected or Sargassum floats out of Impact Zone | N/A | 45 | No |
| SW-3 | >20–80 | 90 | 45 | N/A | 30 | Until visually inspected or | N/A | 45 | No |

| Mitigation Scenario Number | Net Explosive Weight (lb) | Pre-Det Surface Survey (min) | Pre-Det Aerial Survey (min) | Pre-Det PAM (min) | Animal Sightings Waiting Period (min) | Sargassum Habitat Waiting Period | Post-Det Surface Survey (min) | Post-Det Aerial Survey (min) | Post-Post-Det Aerial Survey within One Week |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Sargassum floats out of Impact Zone | | | |
| SW-4 | >80–200 | 120 | 60 | N/A | 30 | Until visually inspected or Sargassum floats out of Impact Zone | N/A | 45 | No |
| SW-5 | >200–500 | 150 | 90 | N/A | 45 | Until visually inspected or Sargassum floats out of Impact Zone | N/A | 45 | No |

**Table 6b. Mitigation overview for net explosive weights used in any configuration in deep water (DW; greater than 200 m)**

| Mitigation Scenario Number | Net Explosive Weight (lb) | Pre-Det Surface Survey (min) | Pre-Det Aerial Survey (min) | Pre-Det PAM (min) | Animal Sightings Waiting Period (min) | Sargassum Habitat Waiting Period | Post-Det Surface Survey (min) | Post-Det Aerial Survey (min) | Post-Post-Det Aerial Survey within One Week |
|---|---|---|---|---|---|---|---|---|---|
| DW-1 | 1–10 | 90 | N/A | N/A | 45 | Until visually inspected or Sargassum floats out of Impact Zone | 30 | N/A | No |
| DW-2 | >10–20 | 90 | 45 | N/A | 45 | Until visually inspected or Sargassum floats out of Impact Zone | N/A | 45 | No |
| DW-3 | >20–80 | 90 | 60 | 150 | 45 | Until visually inspected or Sargassum floats out of Impact Zone | N/A | 45 | Yes |
| DW-4 | >80–200 | 150 | 60 | 180 | 45 | Until visually inspected or Sargassum floats out of Impact Zone | N/A | 45 | Yes |
| DW-5 | >200–500 | 180 | 90 | 270 | 45 | Until visually inspected or Sargassum floats out of Impact Zone | N/A | 45 | Yes |

b) Permittees must stagger the detonation of multiple charges in a series by an interval of at least 0.9 sec (900 msec) between blasts. Otherwise, the combined charge sizes (or net explosive weight) will be used to determine the impact zone.

c) Detonations must only occur during daylight and during a time that would allow for post-detonation surveys. Monitoring will cease if the lead PSO determines that weather or

marine conditions are not adequate for visual observations.

d) Scare charges must not be used to clear impact zones of sea turtles or ESA-listed whales (i.e., sperm whale).
e) Images/pictures taken during any surveys are the property of the U.S. Government and should not be sold, duplicated or used in any way other than for which the project it was intended.
f) Unusual Circumstances: Occasionally, sea turtle(s) remain within the impact zone or are present in high numbers. On rare occasions, very small turtles may be seen in absence of Sargassum habitat near vessels from which monitoring is occurring. During these unusual circumstances, the on-site NMFS PSO must exercise discretion in the implementation of measures or modification of the mitigation procedures that serve to avoid or minimize impacts to sea turtle(s). Typically, modifications of mitigations include increasing the duration of monitoring periods, increasing the number of PSOs, delaying blasting, or a combination of measures. The lead PSO will coordinate with the PROP Manager, appropriate BSEE personnel, and NMFS ESA section 7 consulting biologist when circumstances necessitate additional monitoring.

### A.8.4 Requirements for surface monitoring surveys

a) A surface monitoring survey is required for all blasting scenarios and must be conducted for the length of time indicated for the net explosive weights in Table 6a and Table 6b.
b) Surface monitoring is generally conducted by at least two PSOs. Surface monitoring surveys are to be conducted from the highest vantage point(s) and/or other location(s) that provide the best, clear view of the entire impact zone. These vantage points may be on the structure being removed or proximal surface vessels such as crew boats and derrick barges. Additional PSOs will be positioned around the decommissioning site, as determined by the PROP manager/coordinator in consultation with the lead PSO for additional structures, large net explosive weights, or other circumstances as needed.
c) Surface monitoring must be conducted in adequate light during daylight hours (sunrise to sunset) and with an adequate line of sight including meteorological conditions free of rain or fog, and free of other visual obstructions such as other work vessels.
d) For mitigation scenarios requiring only surface monitoring and no aerial monitoring, surface monitoring must be conducted under good environmental conditions that are conducive for monitoring for sea turtles and marine mammals. Surface-only monitoring must be delayed if: 1.) Sea conditions exceed Beaufort Wind Force Scale 4.5 (see Table 7), or 2.) inadequate line of sight including poor light conditions, meteorological conditions (e.g., rain or fog) and other visual obstructions such as other work vessels.

Table 7. Beaufort Sea State Scale

| Beaufort State | Wind (mph) | Wind (knots) | Wave Height (ft) | Description |
|---|---|---|---|---|
| 0 (calm) | 0–1 | 0–1 | 0 | Sea surface like a mirror |
| 1 (light air) | 1–3 | 1–3 | 0.33–0.65 | Ripples with the appearance of scales, but no foam crests |
| 2 (light breeze) | 4–7 | 4–6 | 0.66–1.9 | Small wavelets, more pronounced. Crests have glassy appearance, but do not break |
| 3 (gentle breeze) | 8–12 | 7–10 | 2–3.2 | Large wavelets. Crests begin to break. Foam of glassy appearance. Perhaps scattered white horses |
| 4 (moderate breeze) | 13–18 | 11–16 | 3.3–6.5 | Small waves, becoming larger; fairly frequent white horses |
| 4.5 (moderate-fresh breeze) | ≤15.5 | ≤13.5 | ≤4.9 | Small waves, crests break, scattered but regular white horses |
| 5 (fresh breeze) | 19–24 | 17–21 | 6.6–9.8 | Moderate waves, more pronounced long form, many white horses, some spray possible |

e) For charge sizes between 0-10 lb, the detonation may proceed if ESA-listed species or Sargassum habitat is not sighted.
f) If a listed species is sighted, or sighted heading inbound toward the impact zone, a waiting period is required (see Waiting Periods in "F" below), or
g) If Sargassum habitat is sighted in the impact zone, a waiting period is required until the Sargassum habitat drifts out of the impact zone (see Waiting Periods in "F" below). Alternatively, a vessel-based PSO could inspect the Sargassum for juvenile sea turtles. This must be done from a small vessel or inflatable boat so that an observer will be close to the water surface and can see small turtles. If no sea turtles are sighted, the waiting period ends and the survey can continue for the remaining period required under the mitigation. If a sea turtle(s) is sighted, the waiting period must continue until the Sargassum drifts out of the impact zone.

### A.8.5 Requirements for pre-det aerial surveys

a) Aerial monitoring surveys are to be conducted from helicopters running standard low- altitude search patterns over the extent of the decommissioning area, including the impact zone that corresponds to the appropriate mitigation scenario.
b) Aerial surveys will be restricted to daylight hours only and cannot begin until the requisite surface monitoring survey has been completed.
c) Aerial surveys will cease if the lead PSO determines that weather or marine conditions are not adequate for visual observations, or when the pilot/removal supervisor determines that helicopter operations must be suspended.
d) When two or more PSOs are on site, NMFS may decide two PSOs conduct the aerial survey or have one or more PSOs continue surface monitoring while the other observer flies the survey. The helicopter will traverse the impact zone at low speed/altitude in the specified survey pattern.
e) Flight patterns during pre-detonation and post-detonation surveys must follow the procedures listed in **Table 8**. At any time during the survey period, the flight path may be altered to investigate sightings and confirm their location in reference to the impact zone.

**Table 8. Flight Patterns During Pre-detonation Surveys**

| Flight Path | 30-minute | 45-minute | 60-minute | 90-minute |
|---|---|---|---|---|
| Follow a spiraling or corkscrewing flight path out from the center of the impact zone to the perimeter of the impact zone. This should be followed by a gradually contracting spiral flight path until the aircraft returns to the center of the impact zone. Repeat the pattern for the specified time period. | 10 minutes | 20 minutes | 25 minutes | 40 minutes |
| Unless higher priority targets (ex. turtles, dolphins, Sargassum) are present, the aircraft should survey outside of the impact zone to a distance approximately equal to the radius of the impact zone to determine if any protected species (sea turtles or marine mammals) might be moving into the area. Expanding and contracting spirals should again be used for the flight path. | 5 minutes | 5 minutes | 5 minutes | 5 minutes |
| The aircraft should survey inside the impact zone and follow the same procedures as during the first part of the survey. However, near the end of the survey period the flight path should usually be concentrated near the center of the impact zone since this is where animals will have the highest risk of severe impact. | 15 minutes | 20 minutes | 30 minutes | 45 minutes |

All surveys should begin at the center of the impact zone. At any time during the entire survey period it may be necessary to alter the flight path to investigate sightings and confirm their location in reference to the impact zone.

a) For charge sizes greater than 10-500 lb, the detonation may proceed if listed species are not sighted.
b) If listed species are sighted, or sighted heading inbound toward the impact zone, a waiting period is required (see Waiting Periods below).
c) If Sargassum habitat is sighted, a waiting period is required until either a) a vessel- based PSO inspects the Sargassum from a small vessel or inflatable boat for juvenile sea turtles to determine if a Sargassum waiting period is required, or b) no vessel-based inspection occurs and a waiting period is triggered until the Sargassum has drifted out of the impact zone. If no sea turtles are sighted during a PSO inspection, the surface monitoring can continue for the remainder of the required monitoring period.

### A.8.6 Requirements for passive acoustic monitoring (PAM)

a) BOEM and BSEE must require operators to provide for review a plan for the use of passive acoustic monitoring for marine mammal detection in the relevant deepwater mitigation scenarios (DW-3, DW-4, and DW-5). The plan must include on-site monitoring protocols, description of the passive acoustic system, software used, recording and storage of data, and other aspects of acoustic monitoring.
b) Persons conducting acoustic surveys will be required to comply with NMFS-approved passive acoustic monitoring protocols and use approved devices and technicians.

c) Acoustic surveys will be run concurrent with requisite pre-detonation surveys, beginning with the surface observations and concluding at the finish of the aerial surveys when the detonation(s) is allowed to proceed. Operators must also report on an assessment of the usefulness, effectiveness, and problems encountered with the use of the method. PAM operators must notify NMFS PSOs immediately when any acoustic targets are detected.
d) For mitigation Scenarios DW-3, DW-4, and DW-5, the detonation may proceed if ESA-listed whales (i.e., sperm whale) are not detected with PAM and the other pre-det surveys do not detect listed species or Sargassum habitat. If ESA-listed whales are detected with PAM (or listed species or Sargassum habitat are otherwise sighted), a waiting period is required (see Waiting Periods below).

### A.8.7 Requirements for waiting periods for surface, aerial, and PAM surveys

a) For pre-det surveys. If sea turtle, Sargassum habitat or ESA-listed whales (i.e., sperm whale) are observed within (or about to enter, heading inbound) the impact zone of any pre-detonation survey, detonations must be delayed until no protected species are inside the impact zone or the Sargassum has drifted out of the impact zone. The waiting period must be completed before the monitoring protocol for the requisite mitigation, and following measures can continue. The purpose of a waiting period is to allow any inbound animal(s) within the impact zone to exit the impact zone under their own volition. For small juvenile sea turtles, the purpose of the waiting period is to allow floating Sargassum habitat to drift out of the area or to confirm no turtles are present in the Sargassum.
b) For surface, aerial, PAM surveys. When listed species are inside the impact zone or inbound toward the impact zone during a surface, aerial or PAM survey:

i. Halt the detonation countdown and implement the waiting period,
ii. Continue opportunistic monitoring during the required waiting period after the last sighting.
iii. If additional sightings occur inside the impact zone or animals sighted heading inbound during the waiting period, then continue surface surveys and start a new waiting period after the occurrence of the last sighting.
iv. Except for waiting periods triggered by *Sargassum* habitat, anytime a waiting period for an aerial survey or for a surface survey for blast scenarios with surface only surveys (when no aerial survey is required) is triggered by a sea turtle or marine mammal sighting, the interrupted survey must be completed over in its entirety. For blast scenarios that include both survey types, only the aerial survey would need to be repeated.
v. Anytime a surface survey waiting period is due only for *Sargassum* habitat, a waiting period is required until either a) a vessel-based PSO inspects the *Sargassum* and determines no turtles are present, or b) no vessel-based inspection occurs and a waiting period is triggered until the Sargassum has drifted out of the impact zone. If no sea turtles are sighted during a PSO inspection of Sargassum habitat, the surface monitoring can continue for the remainder of the required monitoring period.
vi. Anytime an aerial survey waiting period is triggered only due to Sargassum habitat (no marine mammals or large juvenile or adult sea turtles sighted), only the aerial survey needs to be repeated.
vii. Other than in the case of waiting periods described above, any interrupted surface or aerial surveys must be repeated in their entirety. Also, the post-detonation aerial survey must begin immediately following completion of the pre-detonation surface survey.

### A.8.8 Requirements for post-detonation and post-post detonation monitoring surveys

The primary purpose of post-det and post-post-det surveys is to detect any listed species that may have been impacted (stunned, injured or killed) by the detonation and monitor the effectiveness of the pre-det mitigation requirements. Post-det and post-post-det surveys must follow the following measures.

a) A 45-minute post-detonation aerial survey must be conducted by the PSO(s) for all explosive use greater than 10 lb. The aerial survey must be conducted immediately upon conclusion of the detonation.
b) For deepwater, mitigation scenarios DW-3, DW-4 and DW-5, post-post-detonation aerial monitoring surveys must be conducted within 2-7 days after detonation activities conclude, by either helicopter or fixed-wing aircraft. Any distressed, stunned, injured, or dead marine mammals will be noted in the survey report, and if possible, tracked and collected after notifying the National Marine Fisheries Service.
c) Detonations must not occur if the post-detonation survey cannot be concluded prior to sunset.
d) For post-detonation surveys, follow a spiraling or corkscrewing flight path out from the center of the impact zone to the perimeter of the impact zone. This should be followed by gradually contracting spiral flight path until the aircraft returns to the center of the impact zone. If strong currents are present, the down current area should be surveyed outside the impact zone to an appropriate distance. Repeat the pattern for the specified time period.
e) For post-post-detonation surveys, survey a 7x7 nautical mile (nmi) grid centered over the removal site. This grid includes eight, parallel transect lines each measuring 7 nmi long and spaced approximately 1 nmi apart. If strong currents are determined to be present, the the grid may be shifted in the down current direction to an appropriate distance. Any injured or dead sea turtle or marine mammal must be recorded in the survey report and reported to the appropriate stranding network. The stranding network may request that the carcass be tracked and collected if possible.

### A.8.9 Requirements for the recovery of sea turtles

a) BOEM and BSEE must allow an option for trained diver(s) to attempt capture of sea turtles known to be present around a structure slated for removal by explosive severance. NMFS SERO must be notified prior to any capture attempts and the capture, handling, holding, and release of sea turtles must be under the guidance and supervision of NMFS PSOs
b) Sea turtles that are observed to be stunned, injured, or killed during post-det surveys or follow-up aerial surveys must be recovered by PSOs when it is possible to do so. The company and offshore service contractors on site must make assets available, such as vessels, divers, so PSOs can capture or recover stunned, injured, or dead turtles and transport them to shore.
c) Impacted sea turtles that are recovered alive or dead must be immediately transported to shore in coordination with NMFS. Turtles must be transported to an authorized rehabilitation facility for veterinary treatment, or properly stored for necropsy to document the injuries and cause of death.
d) If a sperm whale is unintentionally exposed to a blast, the incident must immediately be reported to the Marine Mammal Stranding Network at 1-877-WHALE-HELP (1- 877-942-5343).

### A.8.10 PSO requirements

a) NMFS PSOs are required to perform surface and aerial surveys. These PSOs are qualified NMFS employees or contractors delegated under the PROP of NMFS' Galveston Laboratory. Explosive-severance contractors or operators enter into agreements with the NMFS Galveston Laboratory to provide PSO monitoring. Under the agreements, NMFS achieves full cost recovery for the goods and services provided. Generally, at least 2 or 3 NMFS PSOs are required to conduct surveys for the mitigation scenarios. When simultaneous surface, aerial, or PAM surveys are required, teams of PSOs may be required. The PROP Manager will determine the required number of teams and PSOs depending on the complexity of severance activities, structure configurations, adequacy of structures and vessels to conduct effective monitoring, and other environmental monitoring conditions.
b) PSOs must brief affected crew and severance contractors of the monitoring efforts and notify topsides personnel to report any sighted animals or Sargassum habitat to the lead PSO immediately;
c) PSOs must establish an active line of communication (such as 2-way radio) with company and blasting personnel;
d) PSOs must devote the entire, uninterrupted survey time to listed species monitoring; and,
e) For aerial surveys, a PSO should sit in one of the seats in the front of the cockpit. This is typically on the port side of the aircraft next to the pilot. Whenever possible, a second PSO should sit on the opposite side of the aircraft so that both sides of the aircraft are surveyed. If additional PSOs are available, seating should be adjacent to a window. Communications equipment should be provided which allows the pilot and PSOs to talk to each other and which provides clear communications.

### A.8.11 Requirements for reporting

a) Any take of listed species should be reported to NMFS at takereport.nmfsser@noaa.gov and nmfs.psoreview@noaa.gov. If the taking involves a whale, the lead PSO must also report it immediately to the Marine Mammal Stranding Network at 1-877-WHALE-HELP (1-877-942-5343).
b) Final monitoring reports (also referred to as the trip report) will be prepared for each explosive removal. The monitoring report responsibilities will be assumed by NMFS's lead PSO and completed following completion of the severance activities.
c) In addition to basic operational data (e.g., area and block, water depth, company/platform information), the trip reports must contain all of the applicable information:

i. Target: Type/Composition (pile, caisson, concrete piling, nylon mooring, etc.) and Diameter and Thickness
ii. Charge: Type (bulk, configured-bulk, linear-shaped, etc.), Charge weight/material (RDX, C4, HMX, etc.), Configuration (internal/external, cut depth [below mud line], water depth [above mud line], etc.), Deployment method (diver, ROV, from surface, etc.)
iii. Monitoring: Survey Type: (pre-det and post-det; surface, aerial, etc.), Time(s) initiated/terminated, Marine Conditions
iv. Observed/Detected summary: Type/number (basic description or species identification, if possible, during all survey types- i.e., surface, aerial, and acoustic and both during pre- and post-detonation periods), Location/orientation – inside/outside impact zone, inbound/outbound, etc., Any "halted-detonation" details – i.e., waiting periods, re- surveys, etc., Any "Take-Event" details – actual MPS injury/mortality.

d) BOEM must provide an annual report to the NMFS consulting biologist describing the total annual structures removed, sea turtle and sperm whale sightings during pre- detonation surveys, sea turtle and sperm whale sightings during post- detonation surveys, visibility during the surveys, details of sea turtles (including loggerhead, green, Kemp's ridley, hawksbill and leatherback sea turtles) and ESA-listed whales (i.e., sperm whale) that were observed injured, killed or otherwise affected and the measures taken for each sea turtle and sperm whale. These annual reports should be combined with any MMPA reporting requirements, as appropriate.
e) The annual reports must be sent electronically by email to nmfs.psoreview@noaa.gov with "Decommissioning Protected Species Annual Report" in the subject header.

### A.8.12 References


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Renaud ML. 1995. Movements and submergence patterns of Kemp's ridley turtles (*Lepidochelys kempii*). J Herpetol. 29:370–374.

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# ATTACHMENT 9: THE BUREAUS' SITE-CLEARANCE TRAWLING PROJECT CRITERIA

### A.10 SITE-CLEARANCE TRAWLING REPORTING

The BOEM/BSEE proposed action under the 2025 NMFS BiOp includes robust avoidance or minimization measures (i.e., protocols), and those measures will continue to be implemented in the Gulf of America as project criteria under the 2026 Endangered Species Committee Order, as well as pursuant to the Bureaus' authority under OCSLA (43 U.S.C. §§ 1331 et seq.). If trawling is used to comply with the site clearance verification requirements under 30 CFR §§ 250.1740-1743 and NTL 2019-G05, which mandates that turtle excluder devices (TEDs) be removed from the trawl nets to facilitate the collection of seabed debris, you must abide by maximum trawl times of 30 minutes, allowing for the removal of any captured sea turtles. If during your trawling activities, you capture a sea turtle in your nets, you must:

1. Resuscitate and release any captured sea turtles per NMFS' guidelines found in
2. **Attachment 10,** Sea Turtle Resuscitation Guidelines;
3. Contact BSEE's Environmental Compliance Division (ECD) at protectedspecies@bsee.gov, NMFS Southeast Turtle Stranding and Salvage Network Hotline (844-732-8785) and closest state coordinator (contact information available at www.fisheries.noaa.gov/marine-life-distress/state-coordinators-and-state-liaisons-sea- turtle-stranding-and-salvage-network), and NMFS' Southeast Regional Office (SERO) at takereport.mmfsser@noaa.gov immediately; and
4. Photograph the turtle and prepare a complete the turtle stranding reporting form. Submit report to NMFS and BSEE (to the email addresses noted above).

In addition to the items specified in NTL 2019-G05, your site clearance verification report must also include:

- Start and stop times for each survey line, based on when trawl net enters and leaves the water; and
- Average speed maintained during each survey line.

# ATTACHMENT 10: THE BUREAUS' SEA TURTLE RESUSCITATION GUIDELINES PROJECT CRITERIA

## A.7 SEA TURTLE RESUSCITATION GUIDELINES

The BOEM/BSEE proposed action under the 2025 NMFS BiOp includes robust avoidance or minimization measures (i.e., protocols), and those measures will continue to be implemented in the Gulf of America as project criteria under the 2026 Endangered Species Committee Order, as well as pursuant to the Bureaus' authority under OCSLA (43 U.S.C. §§ 1331 et seq.). Any sea turtles taken incidentally during the course of oil and gas activities must be handled with due care to prevent injury to live specimens, observed for activity, and returned to the water according to the following procedures:

1. Sea turtles that are actively moving or determined to be dead (as described in paragraph (2)(iv) below) must be released over the stern of the boat. In addition, they must be released only when fishing or scientific collection gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels.
2. Resuscitation must be attempted on sea turtles that are comatose or inactive by:
   i. Placing the turtle on its bottom shell (plastron) so that the turtle is right side up and elevating its hindquarters at least 6 inches (15.2 cm) for a period of 4 to 24 hours. The amount of elevation depends on the size of the turtle; greater elevations are needed for larger turtles. Periodically, rock the turtle gently left to right and right to left by holding the outer edge of the shell (carapace) and lifting one side about 3 inches (7.6 cm) then alternate to the other side. Gently touch the eye and pinch the tail (reflex test) periodically to see if there is a response.
   ii. Sea turtles being resuscitated must be shaded and kept damp or moist but under no circumstance be placed into a container holding water. A water- soaked towel placed over the head, carapace, and flippers is the most effective method in keeping a turtle moist.
   iii. Sea turtles that revive and become active must be released over the stern of the boat only when fishing or scientific collection gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels. Sea turtles that fail to respond to the reflex test or fail to move within 4 hours (up to 24, if possible) must be returned to the water in the same manner as that for actively moving turtles.
   iv. A turtle is determined to be dead if the muscles are stiff (rigor mortis) and/or the flesh has begun to rot; otherwise, the turtle is determined to be comatose or inactive and resuscitation attempts are necessary.

Any sea turtle so taken must not be consumed, sold, landed, offloaded, transshipped, or kept below deck.

### A.7.1 Reporting requirements

Incident reporting should be made to BOEM/BSEE and NMFS (protectedspecies@boem.gov, protectedspecies@bsee.gov, takereport.nmfsser@noaa.gov).

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