

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

SITE-SPECIFIC ENVIRONMENTAL ASSESSMENT

OF

GEOLOGICAL & GEOPHYSICAL
SURVEY APPLICATION NO. L24-004

FOR

BOE EXPLORATION & PRODUCTION LLC

March 12, 2024

RELATED ENVIRONMENTAL DOCUMENTS

Gulf of Mexico OCS Proposed Geological and Geophysical Activities
Western, Central, and Eastern Planning Areas, Final Programmatic Environmental Impact Statement
(OCS EIS/EA BOEM 2017-051)

Gulf of Mexico OCS Oil and Gas Lease Sales: 2017-2022
Gulf of Mexico Lease Sales 249, 250, 251, 252, 253, 254, 256, 257, 259, and 261
Final Environmental Impact Statement
(OCS EIS/EA BOEM 2017-009)

Gulf of Mexico OCS Lease Sale, Final Supplemental Environmental Impact Statement 2018
(OCS EIS/EA BOEM 2017-074)

Gulf of Mexico OCS Oil and Gas Lease Sales 259 and 261: Final Supplemental Environmental Impact Statement
(OCS EIS/EA BOEM 2023-001)

Biological Opinion Oil and Gas Leasing, Exploration, Development, Production, Decommissioning, and All Related
Activities in the Gulf of Mexico Outer Continental Shelf
(FWS April 20, 2018)

Biological Opinion of the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico
(NMFS March 13, 2020)

Amended Incidental Take Statement and Revised Appendices to the Programmatic Biological Opinion on the Gulf of
Mexico Oil and Gas Program
(NMFS April 26, 2021)

Final Rule Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Geophysical Surveys Related
to Oil and Gas Activities in the Gulf of Mexico
(NMFS January 19, 2021)

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

The Bureau of Ocean Energy Management (BOEM) has prepared a Site-Specific Environmental Assessment (SEA) (No. L24-004) complying with the National Environmental Policy Act (NEPA). NEPA regulations under the Council on Environmental Quality (CEQ) (40 CFR § 1501.3 and § 1501.5), the United States Department of the Interior NEPA implementing regulations (43 CFR § 46), 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).

The potential effects or impacts caused by similar actions to that proposed were examined at a basin-wide scale in the Gulf of Mexico (GOM) in the:

- Gulf of Mexico OCS Proposed Geological and Geophysical Activities Western, Central, and Eastern Planning Areas Final Programmatic Environmental Impact Statement (GOM G&G PEIS) (OCS EIS/EA BOEM 2017-051);
- Gulf of Mexico OCS Oil and Gas Lease Sales: 2017-2022 Gulf of Mexico Lease Sales 249, 250, 251, 252, 253, 254, 256, 257, 259, and 261 Final Environmental Impact Statement (Multisale EIS) (OCS EIS/EA BOEM 2017-009);
- Gulf of Mexico Lease Sale Final Supplemental Environmental Impact Statement 2018 (2018 SEIS) (OCS EIS/EA BOEM 2017-074);
- Gulf of Mexico OCS Oil and Gas Lease Sales 259 and 261: Final Supplemental Environmental Impact Statement 2023 (2023 SEIS) (USDOJ, BOEM 2023-001);
- Biological Opinion Oil and Gas Leasing, Exploration, Development, Production, Decommissioning, and All Related Activities in the Gulf of Mexico Outer Continental Shelf (FWS 2018 BO) (Issued by United States Fish and Wildlife Service [FWS] April 20, 2018);
- Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico (NMFS 2020 BO) (Issued by National Marine Fisheries Service [NMFS] March 13, 2020);
- Amended Incidental Take Statement and Revised Appendices to the Programmatic Biological Opinion on the Gulf of Mexico Oil and Gas Program (NMFS 2021 Amended ITS) (Issued by NMFS April 26, 2021);
- Final Rule Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Geophysical Surveys Related to Oil and Gas Activities in the Gulf of Mexico (Issued by NMFS January 19, 2021); and
- Biological Environmental Background Report for the Gulf of Mexico OCS Region (2021 BEBR).

This SEA tiers from these evaluations and considers the impacts of the proposed action.

The Proposed Action: BOE Exploration & Production LLC (BOE) proposes to conduct a geologic survey consisting of box cores, piston cores, jumbo piston cores, Shelby tube stinger and cone penetrometer test (CPT) measurement tools. The proposed coring sites are located in the Central Planning Area of the GOM. The project area covers 8 blocks in and near Mississippi Canyon Area Block 761. The area of the proposed action is approximately 50 miles (mi)(80 kilometers [km]) from the nearest Louisiana shoreline and in water depths ranging from approximately 3,000 – 3,550 feet (ft)(914 – 1,082 meters [m]). The operations will be conducted from the *R/V Proteus*. Site-specific analysis was completed using BOE's description of the proposed operations; however, specific technical information regarding the G&G activities described in the permit application is proprietary and therefore not included in this document. The proposed survey is expected to take approximately ten days to complete and will begin in the Spring of 2024.

Factors Considered in this Determination: The impacts from the proposed action are further analyzed at the site-specific level in this Environmental Assessment. The impact analysis for the proposed activity focused on the geological and geophysical activities and the resources that may be potentially impacted. The impact producing factors (IPF) include: (1) seafloor disturbance, (2) vessel noise, (3) vessel traffic, and (4) marine trash and debris.

In this SEA BOEM has considered three alternatives: (1) No Action; (2) Proposed Action as Submitted; and (3) Proposed Action with Conditions of Approval. BOEM has assessed the impacts of the proposed action on the following resources:

- marine mammals;
- sea turtles;
- benthic communities; and
- archaeological resources.

Individual animals are vulnerable to injury if hit by the survey vessel from the proposed action. The application of the vessel avoidance condition of approval is designed to remove the possibility of ship strike to the animals. Impact significance levels are explained in **Chapter 3.1** of this SEA. Impacts from the proposed activities to marine mammals, sea turtles, archaeological resources, and other users have been mitigated to negligible. Potential impacts to benthic communities were determined to be negligible.

Our evaluation in this SEA has selected Alternative 3 and serves as the basis for approving the proposed activity. BOEM concludes that no significant impacts are expected to occur to any affected resources by allowing the proposed action to proceed, provided that the specific conditions of approval identified below are met by the operator.

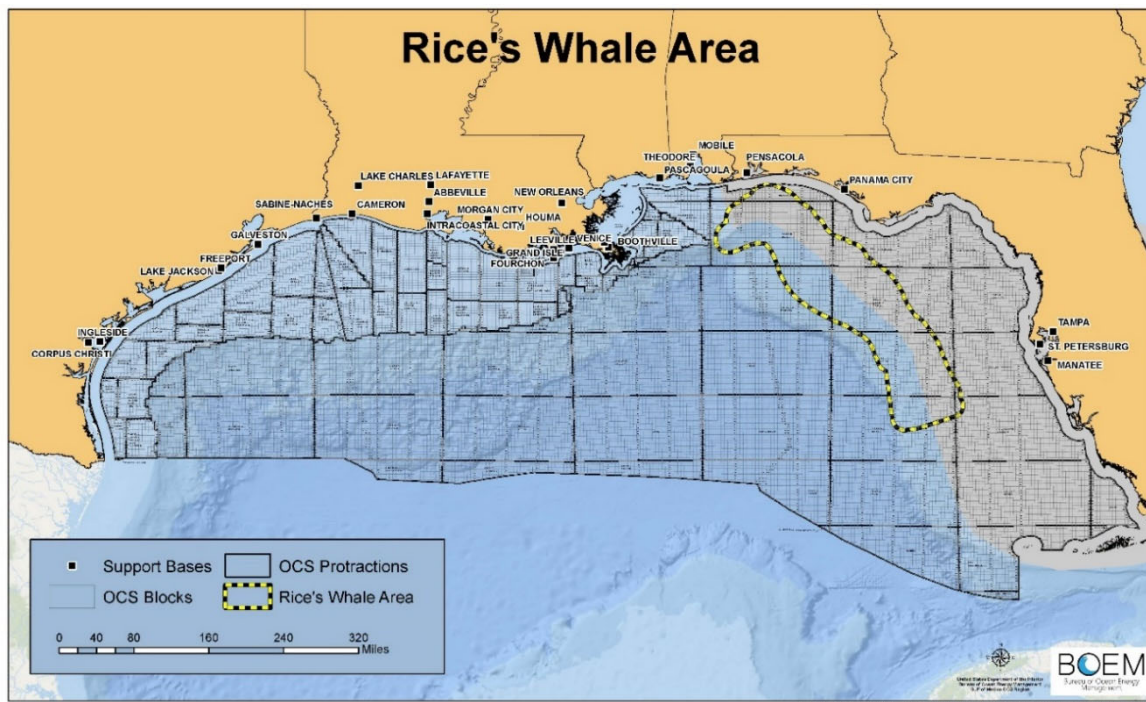
- **COMPLIANCE WITH BIOLOGICAL OPINION TERMS AND CONDITIONS AND REASONABLE AND PRUDENT MEASURES:** This approval is conditioned upon compliance with the Reasonable and Prudent Measures and implementing Terms and Conditions of the Biological Opinion issued by the National Marine Fisheries Service on March 13, 2020, and the amendment issued on April 26, 2021. This includes mitigation, particularly any appendices to Terms and Conditions applicable to the plan, as well as record-keeping and reporting sufficient to allow BOEM and BSEE to comply with reporting and monitoring requirements under the BiOp; and any additional reporting required by BOEM or BSEE developed as a result of BiOp implementation. The NMFS Biological Opinion may be found here: (<https://www.fisheries.noaa.gov/resource/document/biological-opinion-federally-regulated-oil-and-gas-program-activities-gulf-mexico>). The Appendices and protocols may be found here: (<https://www.fisheries.noaa.gov/resource/document/appendices-biological-opinion-federally-regulated-oil-and-gas-program-gulf-mexico>). The amendment provided updates to Appendices A, C and I which may be found here: <https://repository.library.noaa.gov/view/noaa/29355>.
- **NOTIFICATION OF INTENTION TO TRANSIT RICE'S WHALE AREA CONDITION OF APPROVAL (COA):** Operators or their recognized representative must notify the Bureau of Ocean Energy Management (BOEM) or Bureau of Safety and Environmental Enforcement (BSEE) as appropriate of their intention to transit through the Rice's (formerly Bryde's in 2020 Biological Opinion and subsequent amendment) whale area (from 100- to 400- meter isobaths from 87.5° W to 27.5° N as described in the species' status review plus an additional 10 km around that area) (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. If proposing to transit through any portion of the Rice's whale area, the BOEM Permit/Plan holder shall submit their notification to transit and concurrence to fulfil the reporting requirements as stated below to BOEM/BSEE (protectedspecies@boem.gov and protectedspecies@bsee.gov). In the case of a post-approval change in vessel route or change in a support base, your intention to transit through the Rice's whale area should be made by contacting the BOEM or BSEE Point of Contact for the most recent applicable permit or application. 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). You will be required to follow the requirements defined below as originally outlined (as Bryde's whale) in the 2020 Biological Opinion and April 2021 Amendment to the Incidental Take Statement and Revised Appendices issued by the National Marine Fisheries Service (NMFS). Note these conditions of approval refer to the species as the Rice's whale (*Balaenoptera ricei*). Until 2021, the species was known as Bryde's whale (*Balaenoptera edeni*).
 1. Vessel operators and crews must maintain a vigilant watch for Rice's whales 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).



2. If transiting within the Rice's whale area (figure below), operators must notify BOEM and/or BSEE of their plans prior to transit and include what port is used for mobilization and demobilization and explain why the transit is necessary. If an unavoidable emergency transit through this area occurs (i.e., safety of the vessel or crew is in doubt or the safety of life at sea is in question), it must be reported immediately after the emergency is over and must include all required information referenced herein. After completing transit through the Rice's whale area, you must prepare a report of transit describing the time the vessel entered and departed the Rice's whale area, any Rice's whale sightings or interactions (e.g., vessel avoidance) that occurred during transit, and any other marine mammal sightings or interactions. Minimum reporting information is described below:
 - i. The plan, permit or other BOEM or BSEE number used to identify the activity;
 - ii. Automatic Identification System (AIS), if available;
 - iii. Time and date vessel entered and exited the Rice's whale area;
 - iv. Time, date, water depth, and location (latitude/longitude) of the first sighting of the animal;
 - v. Name, type, and call sign of the vessel in which the sighting occurred;
 - vi. Species identification (if known) or description of the animal involved;
 - vii. Approximate size of animal (if known);
 - viii. Condition of the animal during the event and any observed injury / behavior (if known);
 - ix. Photographs or video footage of the animal, if available;
 - x. General narrative and timeline describing the events that took place;
 - xi. Time and date vessel departed Rice's whale area;
 - xii. Trackline (e.g., time, location, and speed) of vessel while within Rice's whale area; and
 - xiii. 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. Upon conclusion of transit, operators must submit reports to protectedspecies@boem.gov and protectedspecies@bsee.gov within 24 hours of transit through the Rice's whale area. The title of the email should include "Transit through Rice's Whale Area."
4. All vessels, regardless of size, must observe a 10-knot, year-round speed restriction in the Rice's whale area during daylight hours. 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.

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 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 U.S. Coast Guard. If the U.S. Coast Guard does not require AIS for the vessel, it is strongly encouraged. At minimum, the reporting (as specified within this COA) must be followed and include trackline (e.g., time, location, and speed) data.
7. No transit is permissible 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).
8. If an operator while operating within the Rice's whale area
 - i. Exceeds the 10-knot vessel speed,
 - ii. Does not maintain a 500 m minimum separation distance from a Rice's whale, and/or
 - iii. Conducts transit 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 transit report with the title "Transit Deviation" in the subject line. The notification must provide a detailed explanation as to why the Transit Deviation occurred.
9. This COA 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 the amended Appendix C - Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols.



- **MARINE TRASH AND DEBRIS AWARENESS AND ELIMINATION:** The applicant will follow the protocols provided in Appendix B. Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols found in the Biological Opinion issued by the National Marine Fisheries Service on March 13, 2020. The Appendix can be accessed on NOAA Fisheries internet website at

<https://www.fisheries.noaa.gov/resource/document/appendices-biological-opinion-federally-regulated-oil-and-gas-program-gulf-mexico>.

- **VESSEL-STRIKE AVOIDANCE/REPORTING:** The applicant will follow the protocols provided under Appendix C. Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols found in the Biological Opinion amendment issued by the National Marine Fisheries Service on April 26, 2021. The guidance can be accessed on the NOAA Fisheries internet site at <https://repository.library.noaa.gov/view/noaa/29355>.
- **SEA TURTLE RESUSCITATION GUIDELINES:** The applicant will follow the guidance provided under Appendix J. Sea Turtle Handling and Resuscitation Guidelines found in the Biological Opinion issued by the National Marine Fisheries Service on March 13, 2020. The guidance can be accessed on the NOAA Fisheries internet site at <https://www.fisheries.noaa.gov/resource/document/appendices-biological-opinion-federally-regulated-oil-and-gas-program-gulf-mexico>.
- **SLACK-LINE PRECAUTIONS CONDITION OF APPROVAL:** If operations require the use of flexible, small diameter (< 2 inch) lines to support operations (with or without divers), operators/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 Endangered Species Act [ESA] and/or Marine Mammal Protection Act [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 utilize 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 in the *Reporting Requirements* COA must be followed as soon as safety permits.
- **REPORTING REQUIREMENTS CONDITION OF APPROVAL:** 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 Endangered Species Act [ESA] and/or Marine Mammal Protection Act [MMPA]) that could be present during operations. In case of entrapment, procedures and measures for reporting are dependent upon the situation at hand. **These requirements replace those specific to dead and injured species reporting in respective sections of Appendix A (insofar as they relate to geophysical surveys) and Appendix C of the 2020 Biological Opinion on the Bureau of Ocean Energy Management's Oil and Gas Program Activities in the Gulf of Mexico.**

Incidents Requiring Immediate Reporting

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/entrapment is observed).

1. As soon as personnel and/or diver safety is ensured, report the incident to National Marine Fisheries Service (NMFS) by contacting the appropriate expert for 24-hr response. If you do not receive an immediate response, you must keep trying until contact is made. Any failed attempts should be documented. Contact information for reporting is as follows:
 - a. **Marine mammals:** contact **Southeast Region's Marine Mammal Stranding Hotline at 1-877-433-8299.**
 - b. **Sea turtles:** contact **Brian Stacy, Veterinary Medical Officer at 352-283- 3370.** If unable to reach Brian Stacy, contact Lyndsey Howell at 301-310- 3061. This includes the immediate reporting of **any observation of a leatherback sea turtle within a moon pool.**
 - c. 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.
 - d. Minimum reporting information is described below:
 - i. Time, date, water depth, and location (latitude/longitude) of the first discovery of the animal;
 - ii. Name, type, and call sign of the vessel in which the event occurred;
 - iii. Equipment being utilized at time of observation;
 - iv. Species identification (if known) or description of the animal involved;
 - v. Approximate size of animal;
 - vi. Condition of the animal during the event and any observed injury / behavior;
 - vii. Photographs or video footage of the animal, only if able; and
 - viii. General narrative and timeline describing the events that took place.
2. After the appropriate contact(s) have been made for guidance/assistance as described in 1 above, you 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. You may also contact this number if you do not receive a timely response from the appropriate contact(s) listed in 1. above.
 - a) Minimum post-incident reporting includes all information described above (under 1.d.i-viii) in addition to the following:
 - i. NMFS liaison or stranding hotline that was contacted for assistance;
 - ii. For moon pool observations or interactions:
 - Size and location of moon pool within vessel (e.g., hull door or no hull door);
 - Whether activities in the moon pool were halted or changed upon observation of the animal; and
 - Whether the animal remains in the pool at the time of the report, or if not, the time/date the animal was last observed.

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 above), 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:

Within 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 BSEE (protectedspecies@bsee.gov) and BOEM (protectedspecies@boem.gov):

1. For an initial report, all information described under 1.d.i-viii above should be included.
 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 (e.g., drilling, preparation for demobilization, etc.);
 - 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/date the animal was last observed.
- **NON-RECURRING MITIGATION FOR THE PROTECTION OF POTENTIAL ARCHAEOLOGICAL RESOURCES:** This review indicates that no known archaeological targets exist within the area of proposed coring operations within the Federal waters of the Outer Continental Shelf (OCS). Significant portions of the project area within the OCS have received either limited or no previous archaeological survey. These areas could contain additional archaeological materials that may be impacted by the proposed operations.

If the applicant discovers human-made debris that appears to indicate the presence of a shipwreck (e.g., a sonar image or visual confirmation of an iron, steel, or wooden hull, wooden timbers, anchors, concentrations of human-made objects, such as bottles or ceramics, piles of ballast rock, aircraft wreckage or remains) within or adjacent to the area during the proposed survey operations, the applicant will be required to immediately halt operations, take steps to ensure that the site is not disturbed in any way, and contact the BOEM Regional Supervisor of the Office of Environment within 48-hours of its discovery. The applicant must cease all operations within 1,000 feet (305 meters) of the site until the Regional Director instructs them on what steps must be taken to assess the site's potential historic significance and what steps must be taken to protect it. If operations impact any submerged object, the applicant must also submit a report detailing each instance of this activity. This report should include the coordinates of the impact (to DGPS accuracy), a description of the submerged object, any damage that may have resulted from the placement or retrieval operations, and any photographic and/or video imagery that is collected. The applicant must also submit a copy of any data collected as a result of these investigations.

Following the completion of fieldwork, the applicant must submit as-placed plats, at a scale of 1-inch = 1,000 ft, of all cores relative to the listed target and the avoidance boundary. If remote-sensing survey data is collected for any reason during the course of this project (i.e., side-scan sonar, sector-scan sonar, multi-beam bathymetry, or magnetometer), the applicant must submit copies of these data to BOEM.

Conclusion: BOEM has evaluated the potential environmental impacts of the proposed action. Based on SEA No. L24-004, BOEM has determined that the proposed action with conditions of approval would have no significant impact on the marine, coastal, or human environment provided that the avoidance and mitigations measures required through conditions of approval are met by the operator. Therefore, an Environmental Impact Statement will not be required.

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

March 12, 2024
Date

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SITE-SPECIFIC ENVIRONMENTAL ASSESSMENT (SEA)
PREPARED FOR
BOE EXPLORATION & PRODUCTION LLC
GEOLOGICAL AND GEOPHYSICAL SURVEY APPLICATION
NO. L24-004

1. INTRODUCTION

BOE Exploration & Production LLC (BOE) has submitted a permit application (L24-004) to conduct a geologic survey on the Outer Continental Shelf (OCS) of the Gulf of Mexico (GOM). This Site-Specific Environmental Assessment (SEA) evaluates the specific impacts associated with BOE's proposed geological and geophysical (G&G) survey activities. **Chapter 1.3** of this SEA provides specific details on the G&G activities proposed in BOE's application.

The SEA is tiered from:

- Gulf of Mexico OCS Proposed Geological and Geophysical Activities Western, Central, and Eastern Planning Areas Final Programmatic Environmental Impact Statement (GOM G&G PEIS) (OCS EIS/EA BOEM 2017-051) (USDOJ, BOEM, 2017a);
- Gulf of Mexico OCS Oil and Gas Lease Sales: 2017-2022 Gulf of Mexico Lease Sales 249, 250, 251, 252, 253, 254, 256, 257, 259, and 261 Final Environmental Impact Statement (Multisale EIS) (OCS EIS/EA BOEM 2017-009) (USDOJ, BOEM, 2017b);
- Gulf of Mexico Lease Sale Final Supplemental Environmental Impact Statement 2018 (2018 SEIS) (OCS EIS/EA BOEM 2017-074) (USDOJ, BOEM, 2017c);
- Gulf of Mexico OCS Oil and Gas Lease Sales 259 and 261: Final Supplemental Environmental Impact Statement 2023 (2023 SEIS) (USDOJ, BOEM 2023-001);
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- Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico (NMFS 2020 BO) (Issued by National Marine Fisheries Service [NMFS] March 13, 2020) (USDOD, NMFS, 2020);
- Amended Incidental Take Statement and Revised Appendices to the Programmatic Biological Opinion on the Gulf of Mexico Oil and Gas Program (NMFS 2021 Amended ITS) (Issued by NMFS April 26, 2021) (USDOD, NMFS, 2021);
- Final Rule Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Geophysical Surveys Related to Oil and Gas Activities in the Gulf of Mexico (Issued by NMFS January 19, 2021) (*Federal Register*, 2021a); and
- Biological Environmental Background Report for the Gulf of Mexico OCS Region (2021 BEBR) (USDOJ, BOEM, 2021).

"Tiering" is provided in the National Environmental Policy Act (NEPA) implementing regulations (40 CFR § 1501.11 and 1508.1 (ff)) and is designed to reduce and simplify the size of environmental assessments by eliminating repetitive discussions of impacts considered in prior NEPA compliance documents, allowing analyses to focus on those site-specific concerns and effects related to the action proposed. Document tiering in the Bureau of Ocean Energy Management (BOEM) is subject to additional guidance under the United States Department of the Interior (DOI) regulations at 43 CFR § 46.140 wherein the site-specific analysis must note which conditions and effects addressed in the programmatic document remain valid and which conditions and effects require additional review.

For this SEA, all of the analyses prepared in the GOM G&G PEIS, Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS, 2021 BEBR, FWS 2018 BO, NMFS 2020 BO, and NMFS 2021 Amended ITS are sufficiently comprehensive and adequate to support decision making for BOE's proposed activities, with the following exceptions:

- **Vessel Noise and Traffic Impacts on Marine Mammals** – the environmental baseline since completion of the programmatic analyses may have experienced slight changes and/or new information has become available;
- **Vessel Noise and Traffic Impacts on Sea Turtles** – the environmental baseline since completion of the GOM programmatic analyses may have experienced slight changes and/or new information has become available;
- **Seafloor Disturbance** – site specific analysis is required to assess the impacts on biological features and archaeological resources that were not known during the preparation of the programmatic analyses; and

Marine mammals, sea turtles, benthic resources, and archaeology as indicated in the GOM G&G PEIS, are susceptible to impacts from geological activities that may be considered adverse, but not significant. Impacts to fishes and commercial and recreational fisheries from the proposed activities are not expected due to the temporary nature of the operations. Impacts to other uses (military) are not expected because the proposed activities are not located within military warning or Eglin water test areas. This SEA considers the potential for change in the status of resources and the potential for increased sensitivity of those resources to impacts from G&G activities.

Chapter 3 of this SEA will focus on new information relative to the cumulative environmental effects of this action. Where applicable, relevant affected environment discussions and impact analyses from the GOM G&G PEIS, Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS, 2021 BEBR, FWS 2018 BO, NMFS 2020 BO, and NMFS 2021 Amended ITS are summarized and utilized for this site-specific analysis and are incorporated by reference into this SEA. Relevant conditions of approval and monitoring measures identified in the GOM G&G PEIS, Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS, 2021 BEBR, FWS 2018 BO, NMFS 2020 BO, and NMFS 2021 Amended ITS have been considered in the evaluation of the proposed action.

1.1. BACKGROUND

BOEM and the Bureau of Safety and Environmental Enforcement (BSEE) are mandated to manage the development of OCS oil, gas, mineral resources, and renewable energy resources while ensuring safe operations and the protection of the human, marine, and coastal environments. One purpose of BOEM's regulatory program is to ensure that the G&G data is obtained in an environmentally safe manner. BOEM regulates leasing, exploration, development, production, and decommissioning, and they perform environmental analyses during each of these phases. BOEM's Resource Evaluation Program oversees "speculative" G&G data and acquisition and permitting activities pursuant to 30 CFR § 551 and § 580. Specifically, 30 CFR § 551 regulates prelease G&G exploratory operations for oil, gas, and sulfur resources, and 30 CFR § 580 regulates prelease prospecting activities. BOEM's Office of Leasing and Plans oversees "on-lease" or "ancillary" G&G data acquisition pursuant to 30 CFR § 550, which applies to postlease G&G exploratory operations.

The G&G surveys provide information used by industry and government to evaluate the potential for offshore oil and gas resources, renewable energy development, mineral resources exploration and development, and geologic hazards in a particular area. Industry needs accurate data to determine the location, extent, and properties of hydrocarbon resources. Information on shallow geologic hazards and seafloor geotechnical properties assists in the safe and economical exploration, development, production, and transportation of hydrocarbons. Additionally, the results of G&G surveys characterize sea bottom conditions before installing a renewable energy facility or to verify the completion of decommissioning activities.

The scope of the effects on GOM resources from activities proposed in BOE's G&G survey permit application, No. L24-004, were fully discussed and analyzed in the GOM G&G PEIS. Neither the specific location, equipment, nor the duration of this proposal will result in impacts different from those discussed in the GOM G&G PEIS, Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS, 2021 BEBR, FWS 2018 BO, NMFS 2020 BO, or NMFS 2021 Amended ITS prepared since that time. Existing peer-reviewed literature and environmental monitoring suggests the proposed activity will not result in a different cumulative impact conclusion from what was made in the GOM G&G PEIS, Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS, 2021 BEBR, FWS 2018 BO, or NMFS 2020 BO (as

amended). This information was not available or considered during the preparation of the GOM G&G PEIS. Therefore, this SEA was prepared by BOEM to evaluate the operator's proposed G&G activities in light of any new changes in the baseline and/or new information.

1.2. PURPOSE OF AND NEED FOR THE PROPOSED ACTION

BOE has submitted a permit application L24-004 to conduct a G&G activity on the OCS. The permit application proposes to collect data using box cores, piston cores, jumbo piston cores, Shelby tube stinger and cone penetrometer test (CPT) measurement tools. This information can be utilized to evaluate the potential for, and develop plans for, the development and production of hydrocarbon resources on the OCS, which would help satisfy the Nation's need for energy. Additional information regarding other survey activities can be found in Appendix F of the GOM G&G PEIS.

The need for this action is established by BOEM's responsibility under the Outer Continental Shelf Lands Act (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 the OCSLA, 43 U.S.C. 1340, requires anyone seeking to conduct such activities to first obtain approval from BOEM. The Secretary of the Interior oversees the OCS oil and gas program, and BOEM and BSEE are the agencies charged with this oversight and regulated management of the permitted or otherwise authorized oil and gas activities. The Secretary is required to balance orderly resource development with protection of the human, marine, and coastal environments while ensuring that the U.S. public receives a fair return for resources discovered on and produced from public lands (43 U.S.C. 1332(3)).

In response to the proposed activities in BOE's application, BOEM has regulatory responsibility, consistent with the OCSLA and other applicable laws, to approve, approve with modifications or conditions of approval, or deny the application. BOEM's regulations provide criteria that BOEM will apply in reaching a decision and providing for any applicable conditions of approval.

1.3. DESCRIPTION OF THE PROPOSED ACTION

BOE proposes to conduct a geologic survey consisting of box cores, piston cores, jumbo piston cores, Shelby tube stinger and cone penetrometer test (CPT) measurement tools. The proposed coring sites are located in the Central Planning Area of the GOM. The project area covers 8 blocks in and near Mississippi Canyon Area Block 761. The area of the proposed action is approximately 50 miles (mi)(80 kilometers [km]) from the nearest Louisiana shoreline and in water depths ranging from approximately 3,000 – 3,550 feet (ft)(914 – 1,082 meters [m]). The operations will be conducted from the *R/V Proteus*. Site-specific analysis was completed using BOE's description of the proposed operations; however, specific technical information regarding the G&G activities described in the permit application is proprietary and therefore not included in this document. The proposed survey is expected to take approximately ten days to complete and will begin in the Spring of 2024 (BOE, 2024).

2. ALTERNATIVES CONSIDERED

2.1. NO ACTION ALTERNATIVE

Alternative 1 -If this alternative is selected the applicant would not undertake the proposed activity. This alternative might prevent the exploration and development of hydrocarbons, resulting in the potential loss of royalty income and energy resources for the United States.

2.2. PROPOSED ACTION AS SUBMITTED

Alternative 2 – If this alternative is selected the applicant would undertake the proposed activity as requested in the application. No conditions of approval would be required by BOEM.

2.3. PROPOSED ACTION WITH CONDITIONS OF APPROVAL

Alternative 3 – This is BOEM’s Preferred Alternative. If this alternative is selected the applicant would undertake the proposed activity, as requested in the application, but with the conditions of approval identified by BOEM, in coordination with NMFS and in accordance with the NMFS 2020 BO, NMFS 2021 Amended ITS, and NMFS 2021 Incidental Take Regulations (listed in **Chapter 2.4** below and described in the effects analyses), to fully address the site- and project-specific impacts of the proposed action.

2.4. SUMMARY AND COMPARISON OF THE ALTERNATIVES

If selected, Alternative 1, the No Action Alternative, would prevent the applicant from acquiring the proper permits and the subsequent collection of geologic data on the OCS. The information would not be available to industry and government to assist in their evaluation of offshore oil and gas resources, geologic hazards, or potential renewable energy sites in a particular area. Alternative 1 would not result in any impacts to the environmental resources analyzed in **Chapter 3**; however, it does not meet the underlying purpose and need.

If selected, Alternative 2 would allow for the collection of geologic data, as requested in the application, but would not include any additional conditions of approval or monitoring applied by BOEM or NMFS. Alternative 2 meets the underlying purpose and need of the proposed action but could cause unacceptable impacts to the environmental resources analyzed, as described in **Chapter 3** (e.g., injuries to marine mammals and sea turtles from vessel strikes, potential damages to unknown cultural resources on the seafloor). Alternative 2 would not require the implementation of conditions of approval and monitoring measures developed by BOEM, in coordination with the NMFS, to limit the potential for lethal and sublethal impacts to marine mammals and sea turtles.

Alternative 3 is the Preferred Alternative, based on the analysis of potential impacts to resources described in **Chapter 3**, because it meets the underlying purpose and need, and also implements conditions of approval and monitoring requirements that adequately limit or negate potential impacts. Implementation of these standard conditions of approval and monitoring measures was assumed as part of the analysis in the NMFS 2020 Endangered Species Act (ESA) Section 7 Biological Opinion (BO), and NMFS 2021 Amended ITS and BOEM is committed to requiring their implementation. NMFS has provided clarification that G&G coring permits do not need a step-down review or concurrence from NMFS under the 2020 BO (as amended) (USDOC, NMFS, 2020). BOEM is including the NMFS 2020 BO and NMFS 2021 Amended ITS Terms and Conditions and Reasonable and Prudent Measures as mitigation and monitoring measures for approval of this G&G permit application. The G&G activities proposed will provide BOE with sufficiently accurate data to determine the location, extent, and properties of potential hydrocarbon resources. Additionally, the collected data supports BOEM’s regulatory and oversight responsibilities while promoting the development of hydrocarbon resources, potentially resulting in increased royalty income as well as energy resources for the United States.

Other alternatives regarding Agency oversight of the G&G permitting program, identified in Chapter 2 of the GOM G&G PEIS, were reviewed with the alternatives listed above chosen as reasonable for the current proposed action.

Conditions for Approval Required under the Preferred Alternative

The need for and utility of the following conditions of approval and monitoring measures are discussed in the relevant impact analysis chapters of this SEA. The following conditions of approval and reporting requirements were identified to ensure adequate environmental protection and post-activity compliance:

- **COMPLIANCE WITH BIOLOGICAL OPINION TERMS AND CONDITIONS AND REASONABLE AND PRUDENT MEASURES:** This approval is conditioned upon compliance with the Reasonable and Prudent Measures and implementing Terms and Conditions of the Biological Opinion issued by the National Marine Fisheries Service on March 13, 2020, and the amendment issued on April 26, 2021. This includes mitigation, particularly any appendices to Terms and Conditions applicable to the plan, as well as record-keeping and reporting sufficient to allow BOEM and BSEE to comply with reporting and monitoring requirements under the BiOp; and any additional reporting required by BOEM or BSEE

developed as a result of BiOp implementation. The NMFS Biological Opinion may be found here: (<https://www.fisheries.noaa.gov/resource/document/biological-opinion-federally-regulated-oil-and-gas-program-activities-gulf-mexico>). The Appendices and protocols may be found here: (<https://www.fisheries.noaa.gov/resource/document/appendices-biological-opinion-federally-regulated-oil-and-gas-program-gulf-mexico>). The amendment provided updates to Appendices A, C and I which may be found here: <https://repository.library.noaa.gov/view/noaa/29355>.

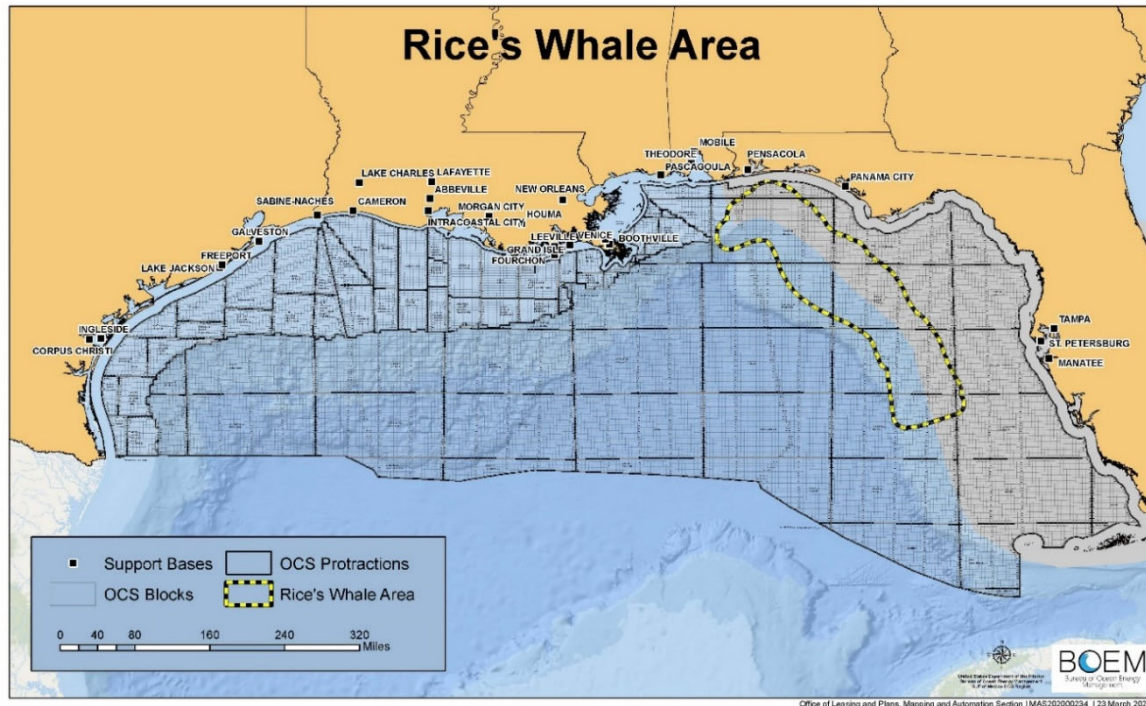
- **NOTIFICATION OF INTENTION TO TRANSIT RICE'S WHALE AREA CONDITION OF APPROVAL (COA):** Operators or their recognized representative must notify the Bureau of Ocean Energy Management (BOEM) or Bureau of Safety and Environmental Enforcement (BSEE) as appropriate of their intention to transit through the Rice's (formerly Bryde's in 2020 Biological Opinion and subsequent amendment) whale area (from 100- to 400- meter isobaths from 87.5° W to 27.5° N as described in the species' status review plus an additional 10 km around that area) (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. If proposing to transit through any portion of the Rice's whale area, the BOEM Permit/Plan holder shall submit their notification to transit and concurrence to fulfil the reporting requirements as stated below to BOEM/BSEE (protectedspecies@boem.gov and protectedspecies@bsee.gov). In the case of a post-approval change in vessel route or change in a support base, your intention to transit through the Rice's whale area should be made by contacting the BOEM or BSEE Point of Contact for the most recent applicable permit or application. 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). You will be required to follow the requirements defined below as originally outlined (as Bryde's whale) in the 2020 Biological Opinion and April 2021 Amendment to the Incidental Take Statement and Revised Appendices issued by the National Marine Fisheries Service (NMFS). Note these conditions of approval refer to the species as the Rice's whale (*Balaenoptera ricei*). Until 2021, the species was known as Bryde's whale (*Balaenoptera edeni*).

1. Vessel operators and crews must maintain a vigilant watch for Rice's whales 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).



2. If transiting within the Rice's whale area (figure below), operators must notify BOEM and/or BSEE of their plans prior to transit and include what port is used for mobilization and demobilization and explain why the transit is necessary. If an unavoidable emergency transit through this area occurs (i.e., safety of the vessel or crew is in doubt or the safety of life at sea is in question), it must be reported immediately after the emergency is over and must include all required information referenced herein. After completing transit through the Rice's whale area, you must prepare a report of transit describing the time the vessel entered and departed the Rice's whale area, any Rice's whale sightings or interactions (e.g., vessel avoidance) that occurred during transit, and any other marine mammal sightings or interactions. Minimum reporting information is described below:
 - i. The plan, permit or other BOEM or BSEE number used to identify the activity;
 - ii. Automatic Identification System (AIS), if available;
 - iii. Time and date vessel entered and exited the Rice's whale area;

- iv. Time, date, water depth, and location (latitude/longitude) of the first sighting of the animal;
 - v. Name, type, and call sign of the vessel in which the sighting occurred;
 - vi. Species identification (if known) or description of the animal involved;
 - vii. Approximate size of animal (if known);
 - viii. Condition of the animal during the event and any observed injury / behavior (if known);
 - ix. Photographs or video footage of the animal, if available;
 - x. General narrative and timeline describing the events that took place;
 - xi. Time and date vessel departed Rice's whale area;
 - xii. Trackline (e.g., time, location, and speed) of vessel while within Rice's whale area; and
 - xiii. 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. Upon conclusion of transit, operators must submit reports to protectedspecies@boem.gov and protectedspecies@bsee.gov within 24 hours of transit through the Rice's whale area. The title of the email should include "Transit through Rice's Whale Area."
 4. All vessels, regardless of size, must observe a 10-knot, year-round speed restriction in the Rice's whale area during daylight hours. 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.
 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 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 U.S. Coast Guard. If the U.S. Coast Guard does not require AIS for the vessel, it is strongly encouraged. At minimum, the reporting (as specified within this COA) must be followed and include trackline (e.g., time, location, and speed) data.
 7. No transit is permissible 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).
 8. If an operator while operating within the Rice's whale area
 - i. Exceeds the 10-knot vessel speed,
 - ii. Does not maintain a 500 m minimum separation distance from a Rice's whale, and/or
 - iii. Conducts transit 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 transit report with the title "Transit Deviation" in the subject line. The notification must provide a detailed explanation as to why the Transit Deviation occurred.
 9. This COA 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 the amended Appendix C - Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols.



- **MARINE TRASH AND DEBRIS AWARENESS AND ELIMINATION:** The applicant will follow the protocols provided in Appendix B. Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols found in the Biological Opinion issued by the National Marine Fisheries Service on March 13, 2020. The Appendix can be accessed on NOAA Fisheries internet website at <https://www.fisheries.noaa.gov/resource/document/appendices-biological-opinion-federally-regulated-oil-and-gas-program-gulf-mexico>.
- **VESSEL-STRIKE AVOIDANCE/REPORTING:** The applicant will follow the protocols provided under Appendix C. Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols found in the Biological Opinion amendment issued by the National Marine Fisheries Service on April 26, 2021. The guidance can be accessed on the NOAA Fisheries internet site at <https://repository.library.noaa.gov/view/noaa/29355>.
- **SEA TURTLE RESUSCITATION GUIDELINES:** The applicant will follow the guidance provided under Appendix J. Sea Turtle Handling and Resuscitation Guidelines found in the Biological Opinion issued by the National Marine Fisheries Service on March 13, 2020. The guidance can be accessed on the NOAA Fisheries internet site at <https://www.fisheries.noaa.gov/resource/document/appendices-biological-opinion-federally-regulated-oil-and-gas-program-gulf-mexico>.
- **SLACK-LINE PRECAUTIONS CONDITION OF APPROVAL:** If operations require the use of flexible, small diameter (< 2 inch) lines to support operations (with or without divers), operators/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 Endangered Species Act [ESA] and/or Marine Mammal Protection Act [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 utilize 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 in the *Reporting Requirements* COA must be followed as soon as safety permits.
- **REPORTING REQUIREMENTS CONDITION OF APPROVAL:** 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 Endangered Species Act [ESA] and/or Marine Mammal Protection Act [MMPA]) that could be present during operations. In case of entrapment, procedures and measures for reporting are dependent upon the situation at hand. **These requirements replace those specific to dead and injured species reporting in respective sections of Appendix A (insofar as they relate to geophysical surveys) and Appendix C of the 2020 Biological Opinion on the Bureau of Ocean Energy Management's Oil and Gas Program Activities in the Gulf of Mexico.**

Incidents Requiring Immediate Reporting

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/entrapment is observed).
1. As soon as personnel and/or diver safety is ensured, report the incident to National Marine Fisheries Service (NMFS) by contacting the appropriate expert for 24-hr response. If you do not receive an immediate response, you must keep trying until contact is made. Any failed attempts should be documented. Contact information for reporting is as follows:
 - a. **Marine mammals:** contact **Southeast Region's Marine Mammal Stranding Hotline at 1-877-433-8299.**
 - b. **Sea turtles:** contact **Brian Stacy, Veterinary Medical Officer at 352-283- 3370.** If unable to reach Brian Stacy, contact Lyndsey Howell at 301-310- 3061. This includes the immediate reporting of **any observation of a leatherback sea turtle within a moon pool.**
 - c. 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.
 - d. Minimum reporting information is described below:
 - i. Time, date, water depth, and location (latitude/longitude) of the first discovery of the animal;
 - ii. Name, type, and call sign of the vessel in which the event occurred;
 - iii. Equipment being utilized at time of observation;
 - iv. Species identification (if known) or description of the animal involved;
 - v. Approximate size of animal;
 - vi. Condition of the animal during the event and any observed injury / behavior;
 - vii. Photographs or video footage of the animal, only if able; and

- viii. General narrative and timeline describing the events that took place.
2. After the appropriate contact(s) have been made for guidance/assistance as described in 1 above, you 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. You may also contact this number if you do not receive a timely response from the appropriate contact(s) listed in 1. above.
- a) Minimum post-incident reporting includes all information described above (under 1.d.i-viii) in addition to the following:
- i. NMFS liaison or stranding hotline that was contacted for assistance;
 - ii. For moon pool observations or interactions:
 - Size and location of moon pool within vessel (e.g., hull door or no hull door);
 - Whether activities in the moon pool were halted or changed upon observation of the animal; and
 - Whether the animal remains in the pool at the time of the report, or if not, the time/date the animal was last observed.

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 above), 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:

Within 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 BSEE (protectedspecies@bsee.gov) and BOEM (protectedspecies@boem.gov):

1. For an initial report, all information described under 1.d.i-viii above should be included.
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 (e.g., drilling, preparation for demobilization, etc.);
 - 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/date the animal was last observed.

- **NON-RECURRING MITIGATION FOR THE PROTECTION OF POTENTIAL ARCHAEOLOGICAL RESOURCES:** This review indicates that no known archaeological targets exist within the area of proposed coring operations within the Federal waters of the Outer Continental Shelf (OCS). Significant portions of the project area within the OCS have received either limited or no previous archaeological survey. These areas could contain additional archaeological materials that may be impacted by the proposed operations.

If the applicant discovers human-made debris that appears to indicate the presence of a shipwreck (e.g., a sonar image or visual confirmation of an iron, steel, or wooden hull, wooden timbers, anchors, concentrations of human-made objects, such as bottles or ceramics, piles of ballast rock, aircraft wreckage or remains) within or adjacent to the area during the proposed survey operations, the applicant will be required to immediately halt operations, take steps to ensure that the site is not disturbed in any way, and contact the BOEM Regional Supervisor of the Office of Environment within 48-hours of its discovery. The applicant must cease all operations within 1,000 feet (305 meters) of the site until the Regional Director instructs them on what steps must be taken to assess the site's potential historic significance and what steps must be taken to protect it. If operations impact any submerged object, the applicant must also submit a report detailing each instance of this activity. This report should include the coordinates of the impact (to DGPS accuracy), a description of the submerged object, any damage that may have resulted from the placement or retrieval operations, and any photographic and/or video imagery that is collected. The applicant must also submit a copy of any data collected as a result of these investigations.

Following the completion of fieldwork, the applicant must submit as-placed plats, at a scale of 1-inch = 1,000 ft, of all cores relative to the listed target and the avoidance boundary. If remote-sensing survey data is collected for any reason during the course of this project (i.e., side-scan sonar, sector-scan sonar, multi-beam bathymetry, or magnetometer), the applicant must submit copies of these data to BOEM.

3. DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

3.1. INTRODUCTION

The discussion below will: (1) describe/summarize the pertinent potentially affected resources; (2) determine whether the proposed G&G activities and their impact-producing factors (IPF) will have significant impacts on the marine, coastal, or human environments of the GOM; and (3) identify significant impacts, if any, that may require further NEPA analysis in an EIS. The description of the affected environment and impact analysis are presented together in this chapter for each resource.

For each potentially affected resource, BOEM staff reviewed and analyzed all currently available peer-reviewed literature and integrated these data and findings into the analyses below. The analyses cite the best available, relevant scientific literature. BOEM performed this analysis to determine whether BOE's proposed survey activities will significantly impact the marine, coastal, or human environments of the GOM. For the impact analysis, resource-specific significance criteria were developed for each category of the affected environment. The criteria for impacts to environmental resources are generally classified into one of the three following levels:

- ***Significant Adverse Impact*** (including those that could be mitigated to nonsignificance);
- ***Adverse but Not Significant Impact***; or
- ***Negligible Impact***.

Preliminary screening for this assessment was based on a review of this relevant literature; previous SEAs; the GOM G&G PEIS (USDOI, BOEM, 2017a); the Multisale EIS (USDOI, BOEM, 2017b); the 2018 GOM SEIS (USDOI, BOEM, 2017c); the GOM Lease Sales 259 and 261 SEIS (USDOI, BOEM, 2023), the 2021 BEBR (USDOI, BOEM, 2021); the NMFS 2020 BO (USDOC, NMFS, 2020); the NMFS 2021 Amended ITS (USDOC, NMFS, 2021); and relevant literature pertinent to historic and projected activities. BOEM initially considered the following resources for impact analysis:

- marine mammals (including Endangered Species Act [ESA] listed species and strategic stocks);
- sea turtles (all are ESA listed species);
- fishes (including listed species and ichthyoplankton);
- commercial and recreational fisheries;
- coastal and marine birds (including ESA listed species);
- benthic communities;
- archaeological resources;
- military uses;
- recreational and commercial diving;
- marine transportation;
- geology/sediments; and
- air and water quality.

In the GOM G&G PEIS, the impact analysis focused on a broad group of G&G activities (including other survey types) and resources with the potential for non-negligible impacts. First, a matrix identifies impact agents associated with each type of G&G activity (Chapter 3 of the GOM G&G PEIS; USDOI, BOEM, 2017a). The IPFs include: (1) active acoustic sound sources; (2) vessel and equipment noise; (3) vessel traffic; (4) aircraft traffic and noise; (5) stand-off distance; (6) vessel discharges; (7) trash and debris; (8) seafloor disturbance; (9) drilling discharges; (10) entanglement; and (11) accidental fuel spills. The preliminary analysis in the GOM G&G PEIS considers surveys of the type proposed by BOE as well as impacts to resources by type of activity. To assist with subsequent coordination, the GOM G&G PEIS' analysis further defines the level of impact associated with each interaction as follows:

- **Nominal:** little or no measurable/detectable impact;
- **Minor:** impacts are detectable, short term, extensive or localized, but less than severe;
- **Moderate:** impacts are detectable, short term, extensive, and severe; or impacts are detectable, short term or long lasting, localized, and severe; or impacts are detectable, long lasting, extensive or localized, but less than severe; and
- **Major:** impacts are detectable, long lasting, extensive, and severe.

The GOM G&G PEIS provides a comprehensive characterization of biological resources that may be adversely affected by G&G activities. This information is summarized in the various resource-specific descriptions of the affected environment and impact analyses in chapters that follow.

However, for the purposes of this SEA, BOEM has not included analyses on resource areas that were evaluated and considered under the GOM G&G PEIS as having nominal impacts or determined the resource would not be impacted by the proposed action. Such a procedure is consistent with the NEPA concept of tiering (40 CFR § 1501.11). Additionally, since no expansion or modification of support bases or related vessel construction work are proposed as a result of this activity, socioeconomic effects were not analyzed due to the type, the temporary nature, and employment size of the survey activity. The most recent evaluation of the best available peer-reviewed scientific literature continues to support this conclusion for the following resource categories:

- commercial and recreational fisheries;
- fish and fisheries (including listed species and ichthyoplankton);
- coastal and marine birds (including ESA listed species);

- recreational and commercial diving;
- marine transportation;
- geology/sediments; and
- air and water quality.

For this SEA, BOEM evaluated the potential impacts from the applicant's proposed G&G activities in the GOM on the following resource categories:

- marine mammals (including threatened/endangered and non-ESA listed species);
- sea turtles (all are ESA listed species);
- benthic communities; and
- archaeological resource.

3.2. MARINE MAMMALS

3.2.1. Description

The marine mammal community is diverse and distributed throughout the northern GOM waters. The GOM's marine mammals are represented by members of the taxonomic order Cetacea, including suborders Mysticeti (i.e., baleen whales) and Odontoceti (i.e., toothed whales), as well as the order Sirenia (i.e., manatee). Twenty-one species of cetaceans and one species of Sirenia regularly occur in the GOM and are identified in the NMFS Stock Assessment Reports (SAR) (Jefferson et al., 2008; Davis et al., 2000; Roberts et al., 2016; Hayes et al., 2018, 2019, 2020, and 2021). A complete description of marine mammals can be found in Chapter 4.2 of the GOM G&G PEIS; Chapter 4.9 of the Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS; Chapter 3.7 of the 2021 BEBR; the NMFS 2017, 2018, 2019, and 2020 SAR (Hayes et al., 2018, 2019, 2020, and 2021); the NMFS 2020 BO; and NMFS 2021 Amended ITS; and are incorporated by reference.

Threatened or Endangered Marine Mammal Species

Only two cetaceans, the sperm whale (*Physeter macrocephalus*) and the GOM Rice's whale (*Balaenoptera ricei*) (previously named Bryde's whale [*Balaenoptera edeni*]), regularly occur in the GOM and are listed as endangered under the ESA. On January 8, 2016 (81 FR 999), the United States Fish and Wildlife Service (FWS) issued a proposed rule and notice to reclassify the West Indian manatee from endangered to threatened (*Federal Register*, 2016) which was later issued as a Final Rule (82 FR 16668) on April 5, 2017 (*Federal Register*, 2017). On December 2, 1970, in the Final Rule (35 FR 18319), the sperm whale was listed as endangered throughout its range. The Final Rule (84 FR 15446) to list the GOM Bryde's (Rice's) whale as endangered was issued and became effective on May 15, 2019 (*Federal Register*, 2019). On August 23, 2021, NMFS published a direct final rule in the *Federal Register* (86 FR 47022): Endangered and Threatened Wildlife and Plants; Technical Corrections for the Bryde's Whale (Gulf of Mexico Subspecies). NMFS revises the common name to Rice's whale, the scientific name to *Balaenoptera ricei*, and the description of the listed entity to entire species. The changes to the taxonomic classification and nomenclature do not affect the species' listing status under the ESA or any protections and requirements arising from its listing. This rule is effective October 22, 2021 without further action (*Federal Register*, 2021b).

The only commonly occurring baleen whale in the northern GOM is the Rice's whale. Most sightings have been made in the De Soto Canyon region and off western Florida, although there have been some in the west-central portion of the northeastern GOM. The best estimate of abundance for Rice's whales in the northern GOM is 51 individuals (Hayes et al., 2021). Based on vessel and aerial survey sightings, the primary core habitat of Rice's whale is in the northeastern GOM, centered in De Soto Canyon in water depths between 150 and 410 m (492 and 1,345 ft) (Rosel et al., 2021). Sperm whales in the GOM are not evenly distributed, showing greater densities in areas associated with oceanic features that provide the best foraging opportunities (USDOC, NMFS, 2020).

Non-ESA-Listed Marine Mammal Species

Nineteen toothed cetaceans (including beaked whales and dolphins) regularly occur in the GOM but are not ESA-listed. Despite being non-listed, the Marine Mammal Protection Act (MMPA) of 1972 protects all marine mammals.

Unusual Mortality Events (UME)

An UME is defined under the MMPA as a “stranding that is unexpected, involves a significant die-off of any marine mammal population, and demands immediate response.” A list of active and closed UMEs with updated information can be found at the following website: <https://www.fisheries.noaa.gov/national/marine-life-distress/active-and-closed-unusual-mortality-events>. There are currently no active UMEs in the GOM.

Marine Mammal Hearing

All marine mammals produce and use sound to communicate with another animal of the same species, to navigate and sense their environment, to locate and capture prey, and to detect and avoid predators (Southall et al., 2007 and 2019). The hearing of marine mammals varies based on individuals, absolute threshold of the species, masking, localization, frequency discrimination, and the motivation to be sensitive to a sound (Richardson et al., 1995). Southall et al. (2007) described the frequency sensitivity in five functional hearing groups of marine mammals by combining behavioral and electrophysiological audiograms with comparative anatomy, modeling, and response measured in ear tissues, which has been updated by Southall et al. (2019) to include six proposed hearing groups. For potentially affected marine mammal species in the GOM, the main functional hearing groups include: (1) low-frequency cetaceans with an estimated auditory bandwidth of 7 Hz to 35 kHz; (2) mid-frequency cetaceans with functional hearing of approximately 150 Hz to 160 kHz; and (3) high-frequency cetaceans with functional hearing estimated from 275 Hz to 180 kHz. These hearing sensitivity and frequency ranges are based on audiograms that are obtained by either: (1) behavioral testing on captive, trained animals; or (2) electrophysiological or auditory evoked potential (AEP) methods (Richardson et al., 1995). Currently, there are no behavioral or AEP audiograms for low-frequency cetaceans available. Audiograms, both behavioral and AEP, are available for some mid-frequency and high-frequency cetaceans (Richardson et al., 1995; Nedwell et al., 2004; Southall et al., 2007 and 2019; Au and Hastings, 2008).

3.2.2. Impact Analysis

The IPFs associated with the proposed action that could affect both ESA-listed and non-ESA-listed marine mammals are primarily noise from survey activities, collisions with survey vessels, and marine trash and debris. Chapter 4.2 of the GOM G&G PEIS contains a discussion of the potential impacts from survey operations on marine mammal resources (USDOI, BOEM, 2017a). Additional information about routine impacts from oil and gas activities on marine mammals is addressed in Chapter 4.9 of the Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS, Chapter 4.7 of the 2021 BEBR, the NMFS 2020 BO, and the NMFS 2021 Amended ITS. The discussions are summarized below and are incorporated by reference into this SEA.

3.2.2.1. Alternative 1

If Alternative 1, the No Action Alternative, is selected the applicant would not undertake the proposed activities. Therefore, the IPFs to marine mammals would not occur. For example, because there would be no vessel traffic related to the coring survey, there would be no risk of collisions with marine mammals.

3.2.2.2. Alternative 2

If Alternative 2, the Proposed Action as Submitted, is selected the applicant would undertake the proposed activities, as requested and conditioned in the application. Examples of potential impacts to marine mammals without implementation of the above referenced conditions of approval and monitoring include, but are not limited to: injury from vessel strikes, disruption of feeding and other behaviors from vessel presence. This Alternative would not adequately limit or negate potential impacts to marine mammals.

3.2.2.3. Alternative 3

If Alternative 3, the Proposed Action with Conditions of Approval, is selected the applicant would undertake the proposed activities, as requested and conditioned in the application; however, the applicant would be required to undertake conditions of approval and monitoring measures as identified by BOEM, in coordination with NMFS and in accordance with the NMFS 2020 BO consultation, the NMFS 2021 Amended ITS, and NMFS 2021 Incidental Take Regulations. For the reasons set forth below, inclusion of this measure under Alternative 3 limits or minimizes potential impacts to marine mammals.

Potential Impacts to Marine Mammals from Vessel Noise

The effects of noise produced by moving G&G survey vessels on marine mammals are difficult to assess because of the wide array of reports of their observed behavioral responses, both between and within species. Actual responses of individuals could vary widely and are heavily dependent on context (Richardson et al., 1995; Southall et al., 2007; Ellison et al., 2011). Vessel noise can have acute effects such as short-term behavioral and stress response. The nature of behavioral response cetaceans exhibit to vessels may depend on vessel speed, size, and distance from the animal, as well as the number and frequency of vessel encounters (USDOD, NMFS, 2020). The dominant source of vessel sound from the proposed action is propeller cavitation, although other ancillary sounds may be produced (Richardson et al., 1995). The intensity of sound from vessels is related to size and speed. Large ships tend to be noisier than small ones and ships underway with a full load or towing/pushing produce more sound than unladen vessels (USDOD, NMFS, 2020). Noise from service-vessel traffic may elicit a startle and/or avoidance reaction from whales and dolphins or mask their sound reception (Tyack, 2008). Vessel noise from the proposed action will produce low levels of noise, generally in the 150 to 170 dB re 1 μ Pa-m at frequencies below 1,000 Hz. Vessel noise is transitory and generally does not propagate at great distances from the vessel. The NMFS 2020 BO (as amended) concluded that the effects of vessel noise to sperm whales are not likely to adversely affect the species and Rice's whales are likely to be adversely affected from vessel noise (USDOD, NMFS, 2020). However, the proposed activities are located outside of the area where the Rice's whale is likely to be present. The operator does not propose operations or support vessel traffic in the Rice's whale area. The behavioral disruptions potentially caused by noise and the presence of vessel traffic will have **negligible** effects on cetacean populations in the northern GOM.

Potential Impacts to Marine Mammals from Vessel Traffic

Slow-moving cetaceans or those that spend extended periods of time at the surface, and deep-diving species (e.g., sperm whales) while on the surface, might be expected to be the most vulnerable to accidental vessel strike (Vanderlaan and Taggart, 2007). Smaller delphinids often approach vessels that are in transit to bow-ride; however, vessel strikes are less common for these faster moving mammals or are underreported (Wells and Scott, 1997). Florida manatees are commonly found in shallow coastal waters of Florida, but they have been found along the entire northern GOM from Florida to Texas (Fertl et al., 2005), though some recent deepwater sightings have occurred. Vessel strikes are the most common cause of human-induced mortality for manatees (State of Florida, Fish and Wildlife Conservation Commission, 2022), and most manatees bear prop scars from contact with vessels. The vast majority of strikes to manatees result from recreational and fishing vessels, not those related to oil and gas activities.

Worldwide, most vessel strikes of large whales occur when vessels are traveling at speeds greater than approximately 10 knots (Conn and Silber, 2013; Jensen and Silber, 2004; Laist et al., 2001; Vanderlaan and Taggart, 2007). If a vessel strike occurs, the animal may experience no injuries, minor non-serious injuries, serious injuries, or death, which largely depends on the size and speed of the vessel (USDOD, NMFS, 2020). Both GOM Rice's whales and sperm whales are vulnerable to vessel strikes. One confirmed vessel strike to a GOM Rice's whale occurred in 2009. One possible lethal strike occurred in 1990 and a non-lethal strike in 2005, both to sperm whales. Additionally, a sperm whale is believed to have been struck by a U.S. Navy vessel in 2001 (USDOD, NMFS, 2020). Most recently, a seismic survey service vessel returning to shore struck a sperm whale in 2020.

The lack of response by sperm whales to oncoming vessels suggest the whales may not hear or see ships approaching or the whales are habituated to the high level of vessel operation activity in the GOM. The Rice's whale spends much of its' time within 15 m of the water surface and at night on the surface, which makes it more likely to be struck by a vessel. With the Rice's whale vessel strike mitigation measures

required by the NMFS 2020 BO, NMFS 2021 Amended ITS, and NMFS 2021 Incidental Take Regulations, and as proposed under Alternative 3, NMFS estimated an annual rate of zero lethal Rice's whale vessel strikes per year from oil and gas vessels traffic greater than 10 knots (USDOC, NMFS, 2020). The proposed activities are located outside of the area where the Rice's whale is likely to be present. The operator has not proposed any service vessels or vessel traffic within the Rice's whale area. Under Alternative 3, the operator is required to provide notification and concurrence to fulfil the Rice's Whale reporting requirements to BOEM and BSEE prior to any vessel transit changes.

In their 2020 BO (as amended), NMFS estimated an annual rate of 0.10 vessel strikes likely to result in no or minor injuries to sperm whales per year from oil and gas activities (USDOC, NMFS, 2020).

By selecting Alternative 3, the operator is required to follow the conditions of approval and monitoring measures in Appendix C: Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols outlined above, in the NMFS 2021 Amended ITS and the NMFS 2021 Incidental Take Regulations. With these conditions of approval and monitoring measures in place, the impacts to sperm whales, Rice's whales, and other marine mammals is determined to be **minor**.

Potential Impacts to Marine Mammals from Marine Trash and Debris

Marine debris is a serious concern in the ocean environment. Plastics, in particular, and from many different sources, pose a threat to the environment and a serious threat to marine mammals. Ingestion of plastic has the potential to cause a digestive blockage which may ultimately lead to the death of a marine mammal (Gall and Thompson, 2015). Entanglement also has the potential to result in injury or mortality for marine mammals (Gall and Thompson, 2015). By selecting Alternative 3, the operator is required to follow the conditions of approval and monitoring measures in Appendix B: Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols outlined above and in the NMFS 2020 BO (as amended). With these conditions of approval and monitoring measures in place, the impacts to sperm whales, Rice's whales, and other marine mammals is determined to be **negligible**.

Conclusion

In conclusion, given the scope, timing, and transitory nature of the proposed action and given the conditions of approval and monitoring requirements in place, vessel related noise is not expected to result in effects to marine mammals in the GOM that would rise to the level of significance. The geographic scope of the proposed action is small in relation to the ranges of marine mammals in the GOM. Survey activities will involve limited vessel traffic that carries some risk of collisions; however, animals may avoid the moving vessels, reducing the likelihood of collision. BOEM has adopted requirements from the NMFS 2020 BO and NMFS 2021 Amended ITS to minimize/negate the chance of vessel strike to marine mammals: Appendix C: Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols. Also, BOEM has adopted requirements from the NMFS 2020 BO (as amended) to minimize/negate the chance of marine trash and debris impacts to marine mammals: Appendix B: Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols. Vessel strike avoidance and marine trash and debris requirements are also assigned by NMFS through the application of the MMPA rule.

3.2.3. Cumulative Impact Analysis

Chapter 4.2 of the GOM G&G PEIS and Chapters 4.9 of the Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS address the cumulative impacts on marine mammals as a result of oil and gas leasing, exploration, development and production activities, including G&G activities.

Activities considered under the cumulative scenario which include the GOM oil and gas program and other anthropogenic and natural activities, including the proposed action, may affect protected marine mammals or critical habitat. Marine mammals could be impacted by the degradation of water quality resulting from operational discharges; vessel traffic; noise generated by platforms, drilling rigs, helicopters, vessels, and G&G surveys; explosive structure removals; oil spills; oil-spill-response activities; loss of debris from service vessels and OCS structures; commercial fishing; capture and removal; and pathogens. The cumulative impact on marine mammals is expected to result in a number of chronic and sporadic sublethal effects (i.e., behavioral effects and nonfatal exposure to or intake of OCS-related contaminants or discarded

debris) that may stress and/or weaken individuals of a local group or population and predispose them to infection from natural or anthropogenic sources.

Few deaths are expected from chance vessel collisions, ingestion of plastic material, commercial fishing, and pathogens. Deaths as a result of structure removals are not expected to occur due to conditions of approval and monitoring measures that the operator must adhere to during operations. Disturbance (noise from vessel traffic and drilling operations, etc.) and/or exposure to sublethal levels of toxins and anthropogenic contaminants may stress animals, weaken their immune systems, and make them more vulnerable to parasites and diseases that normally would not be fatal. The net result of any disturbance will depend upon the size and percentage of the population likely to be affected, the ecological importance of the disturbed area, the environmental and biological parameters that influence an animal's sensitivity to disturbance and stress, or the accommodation time in response to prolonged disturbance (Geraci and St. Aubin, 1980). Natural phenomena, such as tropical storms and hurricanes, are impossible to predict but do occur in the GOM though impacts remain difficult to quantify.

Conclusion

The effects of the proposed action, when viewed in light of the effects associated with other relevant activities, may impact marine mammals in the GOM. With the implementation of the required conditions of approval and monitoring measures for vessel operations under Alternative 3, as well as the limited scope, timing, and geographic location of the proposed action, effects from the proposed survey activities on marine mammals will be **negligible** (vessel noise, marine trash and debris) to **minor** (vessel traffic). For animals that may be continuing to experience stress/sublethal impacts from natural or anthropogenic stressors, the additional measures should act to further reduce impacts and provide an abundance of precaution.

3.3. SEA TURTLES

3.3.1. Description

The life history, population dynamics, status, distribution, behavior, and habitat use of sea turtles can be found in Chapter 4.3 and Appendix E of the GOM G&G PEIS, Chapters 4.9 of the Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS, Chapter 3.6 of the 2021 BEBR, FWS 2018 BO, NMFS 2020 BO, and NMFS 2021 Amended ITS, and are incorporated by reference into this SEA. Of the extant species of sea turtles, five are known to inhabit the waters of the GOM (Pritchard, 1997): the leatherback (*Dermochelys coriacea*), green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), Kemp's ridley (*Lepidochelys kempii*), and loggerhead (*Caretta caretta*). The loggerhead turtle is the most abundant turtle in the GOM (Dodd, 1988). The leatherback turtle is the most abundant turtle in the northern GOM continental slope (Mullin and Hoggard, 2000). These five species are all highly migratory, and individual animals will migrate into nearshore waters as well as other areas of the North Atlantic Ocean, GOM, and Caribbean Sea.

All five species of sea turtles found in the GOM have been federally listed as endangered or threatened since the 1970's. Critical habitat was designated for the distinct population segment (DPS) of Northwest Atlantic loggerhead turtles on July 10, 2014 in 79 CFR 79 39755 39854 (*Federal Register*, 2014).

In 2007, FWS and NMFS published 5-year status reviews for federally listed sea turtles in the GOM (USDOC, NMFS and USDO, FWS, 2007a-e). A 5-year review is an ESA-mandated process that is conducted to ensure that the listing classification of a species as either threatened or endangered is still accurate. Both agencies share jurisdiction for federally listed sea turtles and jointly conducted the reviews. After reviewing the best scientific and commercially available information and data, agencies determined that the current listing classification for the five sea turtle species remain unchanged. Updated 5-year reviews for hawksbill and leatherback turtles were published in 2013 that support the current listing status for these species (USDOC, NMFS and USDO, FWS, 2013a and b).

Sea Turtle Hearing

The anatomy of sea turtle ears and measurements of auditory brainstem responses of green and loggerhead sea turtles demonstrate that sea turtles are sensitive to sounds, with an effective hearing range within low frequencies (Bartol et al., 1999; Lenhardt et al., 1983; Moein et al., 1994; Ridgway et al., 1969). Although external ears are absent, sea turtles have a tympanum composed of layers of superficial tissue over a

depression in the skull that forms the middle ear. The tympanum acts as additional mass loading to the ear, allowing for reduction in the sensitivity of sound frequencies and increasing low-frequency, bone-conduction sensitivity (Bartol et al., 1999; Lenhardt et al., 1985). Lenhardt et al. (1983) and Moein et al. (1993 and 1994) found that bone-conducted hearing appears to be an effective reception mechanism for sea turtles (i.e., loggerhead and Kemp's ridley) with both the skull and shell acting as receiving surfaces for water-borne sounds at frequencies of 250-1,000 Hz. By measuring AEP responses of juvenile green sea turtles to tone pip stimuli, Piniak et al. (2016) found that these turtles have a narrow range of underwater and aerial low frequency hearing. Aerial sound pressure thresholds were lower than those underwater, though they detected a larger frequency range underwater (Piniak et al., 2016). Also, sound intensity level thresholds were lower underwater (Piniak et al., 2016). There is relatively little data on sea turtle hearing, though the current understanding is that sea turtles are low frequency hearing specialists, typically hearing frequencies from 30 Hz to 2.0 kHz (or 2,000 Hz), with a range of maximum sensitivity between 100 to 800 Hz, and a narrower frequency range in air (Bartol et al., 1999; Piniak et al., 2012; Popper et al., 2014). Unlike marine mammals, sea turtles "do not appear to greatly utilize environmental sound, at least at far distances in the open ocean" (USDOC, NMFS, 2007).

3.3.2. Impact Analysis

The diversity of a sea turtle's life history leaves it susceptible to many natural and human impacts, including impacts while it is on land, in the benthic environment, and in the pelagic environment. The IPFs associated with the proposed action that could affect sea turtles include primarily (1) vessel noise and (2) vessel traffic; and (3) marine trash and debris. Chapter 4.3 of the GOM G&G PEIS contains a discussion of the potential impacts from survey operations on sea turtles (USDOI, BOEM, 2017a). Additional information about routine impacts from oil and gas activity on sea turtles is addressed in Chapter 4.9 of the Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS, Chapter 4.6 of the 2021 BEBR, FWS 2018 BO, NMFS 2020 BO, and NMFS 2021 Amended ITS. The discussions are summarized below and are incorporated by reference into this SEA.

3.3.2.1. Alternative 1

If Alternative 1, the No Action Alternative, is selected the applicant would not undertake the proposed activities. Therefore, the IPFs to sea turtles would not occur. For example, there would be no vessel noise that would result in effects to sea turtles. Since there would be no vessel traffic related to the survey activities, there would be no risk of collisions with sea turtles.

3.3.2.2. Alternative 2

If Alternative 2, the Proposed Action as Submitted, is selected the applicant would undertake the proposed activities, as requested and conditioned in the application. Examples of potential impacts to sea turtles without implementation of the above referenced conditions of approval and monitoring measures include, but are not limited to: injury from vessel traffic and disruption of feeding and other behaviors from vessel presence. This Alternative would not adequately limit or negate potential impacts to sea turtles.

3.3.2.3. Alternative 3

If Alternative 3, the Proposed Action with Conditions of Approval, is selected the applicant would undertake the proposed activities, as requested and conditioned in the application; however, the applicant would be required to undertake conditions of approval as identified by BOEM, in coordination with NMFS and in compliance with the NMFS 2020 BO consultation requirements (i.e., Appendix J: Sea Turtle Handling and Resuscitation Guidelines), and the NMFS 2021 Amended ITS. For the reasons set forth below, inclusion of these measure under Alternative 3 limits or negates potential impacts to sea turtles (e.g., vessel strikes, behavioral disruption from vessel presence).

Potential Impacts to Sea Turtles from Vessel 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 action would produce low levels of noise, generally in the 150 to 170 dB re 1 μ Pa-m at frequencies below 1,000 Hz. Vessel noise is transitory and generally does not propagate at great distances from the vessel. Also, available information indicates that sea turtles do not greatly utilize environmental sound. The NMFS 2020 BO (as amended) similarly

concluded that sound sources associated with vessel movement were not likely to adversely affect sea turtles (USDOC, NMFS, 2020). The Popper et al. (2014) sound exposure guidelines were broad-ranging and provided non-quantified, generalized guidelines for shipping noise as a low risk of impairment, unless the turtle is in the near field range (within tens of meters), which would pose a moderate risk of TTS that can recover over time. The risk for noise to cause masking and behavior effects range from low to high depending on the location of the turtle relative to the noise (Popper et al., 2014). The effects to sea turtles from vessel noise are expected to be **negligible**.

Potential Impacts to Sea Turtles from Vessel Traffic

Sea turtles spend at least 3-6 percent of their time at the surface for respiration and perhaps as much as 26 percent of time at the surface for basking, feeding, orientation, and mating (Lutcavage et al., 1997). There is little data available concerning potential sea turtle impacts from accidental vessel strike due to a lack of studies and/or challenges with detecting such impacts (Nelms et al., 2016). Nonetheless, in the GOM, vessel strike from all types of vessels is known to result in sea turtle mortality and injury, with the associated response depending on the size and speed of the vessel (Lutcavage et al. 1997; Work et al., 2010; Nelms et al., 2016). Although sea turtles can move somewhat rapidly, they are still vulnerable to strikes from vessels that are moving at more than four (4) km per hour, which is common in open water (Hazel et al., 2007; Work et al., 2010). Based on the behavioral observations of turtle avoidance of small vessels, green turtles may be susceptible to vessel strikes at speeds as low as two knots (Hazel et al., 2007). Although there have been hundreds of thousands of vessel trips that have been made in support of offshore operations during the past 40 years of OCS oil and gas operations, there have been no reports of OCS-related vessels having struck sea turtles. This is most likely because a strike with a turtle would probably go undetected by larger vessels or strikes are not reported. Despite the lack of on-water reporting, stranding records show that interactions between vessels and sea turtles in the GOM are quite common (USDOC, NMFS, 2020). Data show that collisions with all types of commercial and recreational vessel traffic are a cause of sea turtle mortality in the GOM (Lutcavage et al., 1997). Both live and dead sea turtles are often found with deep cuts and fractures indicative of collision with a boat hull or propeller (Hazel et al., 2007).

Based on sea turtle density estimates in the GOM, the encounter rates between sea turtles and vessels would be expected to be greater in water depths less than 200 m (656 ft) (USDOC, NMFS, 2007). To further minimize the potential for vessel strikes, BOEM requires operators to implement Appendix C: Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols, which contains vessel strike avoidance measures for sea turtles and other protected species. With implementation of these measures and a PSO on the lookout for sea turtles, the NMFS 2020 BO (as amended) concluded that the risk of collisions between oil/gas-related vessels (including those for G&G, drilling, production, decommissioning, and transport) and sea turtles is appreciably reduced, but strikes may still occur. The NMFS 2020 BO (as amended) then grants BOEM an Incidental Take Statement that includes a set number of allowable takes of sea turtles by vessel strikes (USDOC, NMFS, 2020). As per the required reporting under the NMFS 2021 Amended ITS Appendix C: Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols, BOEM monitors for any takes that have occurred as a result of vessel strikes and also requires that any operator immediately report the striking of any animal (see requirements under Appendix C). To date, there have been no reported strikes of sea turtles by G&G survey vessels. Given the scope, timing, and transitory nature of the proposed action and with these established conditions of approval and monitoring measures, effects to sea turtles from vessel collisions are expected to be **minor**.

Potential Impacts to Sea Turtles from Marine Trash and Debris

A variety of trash and debris, which comes from land-based and ocean sources, is commonly observed in the GOM. Turtles may become entangled in drifting debris and ingest fragments of synthetic materials (Gregory, 2009; Gall and Thompson, 2015; Schuyler, 2016). Once entangled, turtles may drown, incur impairment to forage or avoid predators, sustain wounds and infections from the abrasive or cutting action of attached debris, or exhibit altered behavior that threaten their survival (Gall and Thompson, 2015). By selecting Alternative 3, the operator is required to follow the conditions of approval and monitoring measures in Appendix B: Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols outlined above and in the NMFS 2020 BO (as amended). With these conditions of approval and monitoring measures in place, the impacts to sea turtles are determined to be **negligible**.

Conclusion

As described, effects of vessel noise on sea turtles are considered “discountable” (USDOC, NMFS, 2007 and 2020). The risk of impacts from marine trash and debris would not rise to the level of significance given that BOEM requires compliance with Appendix B: Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols. The risk of collisions between sea turtles and vessels associated with the proposed action exist but would not rise to the level of significance given:

- BOEM requires compliance with Appendix C: Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols, which provides guidelines on monitoring programs to minimize the risk of vessel strikes to sea turtles and other protected species and the reporting of any observations of injured or dead protected species.
- The NMFS 2020 BO (as amended) recognizes that these measures should appreciably reduce the potential for vessel strikes. The NMFS 2020 BO (as amended) determined vessels strikes are likely to adversely affect sea turtles related to the proposed actions and granted a limited number of Incidental Take Authorizations to BOEM for sea turtle mortalities by vessel strikes. BOEM continues to assess activity for any strikes to ensure this authority is not exceeded. To date, there have been no reported strikes of sea turtles by G&G survey vessels.
- The scope, timing, and transitory nature of the proposed action will result in limited opportunity for sea turtles and vessel strikes.

3.3.3. Cumulative Impact Analysis

Chapter 4.3 of the GOM G&G PEIS, and Chapter 4.9 of the Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS address the cumulative impacts on sea turtles as a result of oil and gas leasing, exploration, development and production activities, including G&G activities. The information from these documents is incorporated by reference in this SEA.

Activities considered under the cumulative scenario which include the GOM oil and gas program and other anthropogenic and natural activities, including the proposed action, may affect protected sea turtles or critical habitat. Sea turtles may be impacted by the degradation of water quality resulting from operational discharges, vessel traffic, noise generated by platforms, drilling rigs, helicopters and vessels, G&G surveys, explosive structure removals, oil spills, oil-spill-response activities, loss of debris from service vessels and OCS structures, commercial fishing, capture and removal, and pathogens. The cumulative impact of these ongoing OCS activities on sea turtles is expected to result in a number of chronic and sporadic sublethal effects (i.e., behavioral effects and nonfatal exposure to or intake of OCS-related contaminants or discarded debris) that may stress and/or weaken individuals of a local group or population and that may predispose them to infection from natural or anthropogenic sources. Through a systematic review, policy comparison, and stakeholder analysis, Nelms et al. (2016) found that potential impacts of seismic surveys on sea turtles vary (i.e., hearing damage, entanglement, and critical habitat exclusion) and can be obscure due to the lack of research. Thus, understanding the impacts on individuals and populations can be challenging, and additional research is needed (Nelms et al., 2016).

Few deaths are expected from chance collisions with OCS service vessels, ingestion of plastic material, commercial fishing, and pathogens. Few deaths as a result of OCS structure removals may occur but would be minimal due to requisite conditions of approval and monitoring measures. Disturbance (noise from vessel traffic and drilling operations, etc.) and/or exposure to sublethal levels of toxins and anthropogenic contaminants may stress animals, weaken their immune systems, and make them more vulnerable to parasites and diseases that normally would not be fatal. The net result of any disturbance depends upon the size and percentage of the population likely to be affected, the ecological importance of the disturbed area, the environmental and biological parameters that influence an animal’s sensitivity to disturbance and stress, or the accommodation time in response to prolonged disturbance (Geraci and St. Aubin, 1980). A condition of approval is in place to reduce vessel strike mortalities (i.e., Appendix C: Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols).

Natural disturbances such as hurricanes can cause significant destruction of nests and topography of nesting beaches (Pritchard, 1980; Ross and Barwani, 1982; Witherington, 1986). Tropical storms and hurricanes are a normal occurrence in the GOM and along the Gulf Coast. Generally, the impacts have been localized

and infrequent; however, few areas of the Gulf Coast did not suffer some damage in 2004, 2005, 2017, and 2020. Some impacts of the hurricanes, such as loss of beach habitat, continue to impact sea turtles that would have otherwise used those areas as nesting beaches. Increases or decreases in beach armoring and other structures may impact all nesting sea turtles in the areas affected. Hurricanes and tropical activity may temporarily remove some of these barriers to suitable nesting habitat.

Incremental injury effects from the proposed action on sea turtles are expected to be **negligible** for vessel noise and **minor** for vessel collisions but not rise to the level of significance. This is mainly because of the limited scope, duration, and geographic area of the proposed action and the requirements under the NMFS 2020 BO and NMFS 2021 Amended ITS, such as Appendix B: Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols, C: Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols and J: Sea Turtle Handling and Resuscitation Guidelines.

Conclusion

The effects of the proposed action, when viewed in light of the effects associated with other relevant activities, may affect sea turtles occurring in the GOM. With the implementation of the required conditions of approval and monitoring measures for vessel operations (Appendix B: Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols and C: Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols) and the scope of the proposed action, incremental effects from the proposed activities on sea turtles will be **negligible** (vessel noise and marine trash and debris) to **minor** (vessel strikes). The best available scientific information indicates that sea turtles do not greatly use sound in the environment for survival; therefore, disruptions in environmental sound would have little effect.

3.4. BENTHIC COMMUNITIES

3.4.1. Description

For purposes of OCS activity impact analyses, BOEM defines “deepwater benthic communities,” to include chemosynthetic and deepwater coral communities in the GOM as those typically found in water depths of 984 ft (300 m) and greater (USDOI, BOEM, 2017b and c).

A description of chemosynthetic and deepwater coral communities in the GOM region can be found in Chapter 4.5 of the GOM G&G PEIS, Chapter 4.4 of the Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS, and Chapter 3.4 of the 2021 BEBR. The following information is a summary of the descriptions in the EISs, and it is incorporated by reference into this SEA.

The continental slope in the GOM extends from the edge of the continental shelf at a depth of about 656 ft (200 m) to a water depth of approximately 9,840 ft (3,000 m) (USDOI, BOEM, 2017b and c). The vast majority of the GOM has a soft, muddy bottom in which burrowing infauna are the most abundant invertebrates. The proposed survey area generally falls into this category as the water depth of the proposed activity ranges from 3,000 – 3,550 ft (914 – 1,082 m).

A remarkable assemblage of invertebrates is found in association with hydrocarbon seeps in the GOM. Chemosynthetic communities can occur at or near hydrocarbon seeps and are defined as persistent, largely sessile assemblages of marine organisms dependent upon symbiotic chemosynthetic bacteria as their primary food source (MacDonald, 1992). Invertebrate taxa in these communities include tube worms and bivalves, among others. Symbiotic chemosynthetic bacteria live within specialized cells in the invertebrate organisms and are supplied with oxygen and chemosynthetic compounds (methane and sulfides) by the host via specialized blood chemistry (Fisher, 1990). Chemosynthetic bacteria, which live on mats, in sediment, and in symbiosis with chemosynthetic invertebrates, use a carbon source independent of photosynthesis to make sugars and amino acids. The host, in turn, lives off the organic products subsequently released by the chemosynthetic bacteria and may even feed on the bacteria themselves. Chemosynthetic communities can become established when a hard substrate is available for colonization at or near a seep. Depending on the situation, sessile benthic invertebrates can settle on and colonize carbonate substrate. These organisms form additional structure upon the seafloor, increasing the complexity of the habitat that may provide support to a variety of deepwater corals, invertebrates and fishes.

Some deepwater corals form communities occurring at or near hydrocarbon seeps, or on exposed outcrops, and may be found in association with chemosynthetic communities. Deepwater coral communities are also found on shipwrecks, and deepwater oil and gas infrastructure. These coral communities are distinctive and provide three-dimensional habitat for a range of fishes and invertebrates. Hard-bottom habitats in deep water include communities dominated by *Lophelia pertusa*, with other corals such as the bamboo coral (*Keratoisis flexibilis*) and zigzag coral (*Madrepora oculata*). Numerous other invertebrates are also associated with these benthic habitats (Sulak et al., 2008; Cordes et al., 2008; Fisher et al., 2007; Schroeder et al., 2005).

Hydrocarbon seep communities in the GOM have been reported to occur at water depths greater than 300 m (984 ft) (USDOl, BOEM, 2017b and c). To date, there are over 300 deepwater benthic communities comprised of chemosynthetic organisms and/or deepwater corals. Once thought rare, research suggests that deepwater faunal communities are regularly associated with seafloor features commonly found in the vicinity of the primary geophysical signatures of the seabed for hydrocarbon migration to the seafloor. These areas include those where hydrocarbons percolate through sediments or where hydrocarbons move along faults that reach the seafloor. More than 23,000 positive anomalies have been identified from seismic survey data and each may represent a habitat where a hard substrate and a deepwater community may be found. However, until an anomaly has been visited and confirmed, it is unknown if hard substrates are exposed and capable of supporting deepwater benthic communities.

To map areas of probable habitat for deepwater benthic communities, scientists at BOEM analyzed decades of three-dimensional seismic data to classify seafloor returns exhibiting anomalously high or low reflectivity. The areas of high reflectivity represent patches of anomalous seafloor returns that likely indicate patches of hard seafloor that would provide substrate for deepwater benthic communities. Most confirmed hard bottoms in the deepwater GOM were created by the precipitation of calcium carbonate substrate by chemosynthetic bacterial activity and are capable of supporting deepwater benthic communities. However, non-biogenic hard bottoms are also found at escarpments, seafloor-reaching faults, or where salt formations reach the surface. Investigations of the seafloor at patches of high reflectivity indicate that chemosynthetic and coral communities are much more common in the deepwater GOM than previously known (USDOl, BOEM, 2017b and c). Also, areas of low reflectivity (negative anomalies) can be indicative of gassy sediments and mud volcanoes with a high flux of hydrocarbons from the seafloor. Although uncommon, chemosynthetic bivalves may be found in areas with a high flux of hydrocarbons.

3.4.2. Impact Analysis

A detailed impact analysis of the routine, accidental, and cumulative impacts of the proposed activities on chemosynthetic communities and deepwater coral communities can be found in Chapter 4.5 of the GOM G&G PEIS, Chapter 4.4 of the Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS, and Chapter 4.4 of the 2021 BEBR. The following information is a summary of the impact analyses in the GOM G&G PEIS, Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS, and 2021 BEBR, and is incorporated by reference into this SEA.

Any hard substrate communities located in deep water would be particularly sensitive to impacts from OCS activities resulting in bottom disturbances and increased turbidity. Such impacts to these habitats could permanently prevent recolonization by similar organisms requiring hard substrate. The IPFs associated with the proposed activities in the survey area that could affect deepwater benthic communities include physical impacts from placement and recovery of box, piston cores, jumbo piston cores, Shelby tube stinger and CPT measurement tools.

3.4.2.1. Alternative 1

If Alternative 1, the No Action Alternative, is selected the applicant would not undertake the proposed activities. Therefore, the IPF to deepwater benthic communities would not occur. Since there would be no coring samples taken from the proposed activities, there would be no risk of damaging benthic communities from direct impact.

3.4.2.2. Alternative 2

If Alternative 2, the Proposed Action as Submitted, is selected the applicant would undertake the proposed activities, as requested and conditioned in the application. Examples of potential impacts to deepwater benthic communities without implementation of the conditions of approval and monitoring measures noted in **Chapter 2.4** and the following analysis include, but are not limited to, damage from the proposed survey activities. Review of the proposed coring locations verified that no sensitive sessile benthic communities or habitat capable of supporting such communities are within the area expected to be affected by the proposed activities. The conditions of approval outlined in **Chapter 2.4** do not increase or decrease impacts to benthic communities for the proposed survey activities.

3.4.2.3. Alternative 3

If Alternative 3, the Proposed Action with Conditions of Approval, is selected the applicant would undertake the proposed activities, as requested and conditioned in the application; however, the applicant would be required to undertake conditions of approval and monitoring measures as identified by BOEM, in coordination with NMFS and in compliance with the NMFS 2020 BO consultation requirements, and NMFS 2021 Amended ITS. The mitigation and monitoring measures from the NMFS 2020 BO and NMFS 2021 Amended ITS do not address this resource. Review of the proposed coring locations verified that no sensitive sessile benthic communities or habitat capable of supporting such communities are within the area expected to be affected by the proposed activities. The conditions of approval outlined in **Chapter 2.4** do not increase or decrease impacts to benthic communities for the proposed survey activities.

Potential Impacts on Deepwater Benthic Communities from Bottom Disturbances

As described in **Chapter 2** of this SEA, the applicant proposes to conduct geological survey activities that will involve coring activities, disturbing the seafloor in the area of the proposed action. If the cores are taken near or atop a confirmed or potential deepwater benthic community, impacts to these sensitive habitats could permanently prevent recolonization by similar organisms.

If a high-density deepwater benthic community is subjected to impacts by bottom-disturbing activities, potentially severe or catastrophic impacts could occur due to direct impingement by a core sampler or partial to complete burial due to resuspension of sediments. The severity of such an impact could be immediate loss of the community or incremental losses of productivity, reproduction, community relationships, leading to degradation of the overall ecological functions of the community and incremental damage to surrounding communities.

However, the offsets to core positioning proposed by BOEM will allow for deployment of the required cores within the demonstrated capability of the operator and provides for buffering of the seafloor disturbances caused by deployment. This condition of approval ensures the potential for impacts resulting from the proposed survey activities are minimal. The effects to benthic communities from bottom disturbances are expected to be **negligible**.

Conclusion

Features capable of supporting deepwater benthic communities are located within the survey area. As discussed above, the site-specific deepwater benthic communities review conducted for the proposed action determined that there are no features capable of supporting deepwater benthic communities within 500 ft of the proposed survey coring target areas. If the proposed samplers or CPT measurement tools were to contact one of the sites, it would have the potential to destroy any sessile organisms that may be present or cause destruction of underlying carbonate structures on which organisms rely for substrate as well as dispersion of hydrocarbon sources. These impacts could be severe in the immediate area; with recovery times as long as 200 years for mature tube-worm communities and with some corals aged at over 2,000 years (Prouty et al., 2011), there is the possibility a community may never recover. The same geophysical conditions associated with the potential presence of chemosynthetic communities can also result in hard carbonate substrate upon which deepwater corals can attach. The proposed activities may impact the ecological function, biological productivity, or distribution of hard-bottom deepwater benthic (both chemosynthetic and deepwater coral) communities. Burial or disruption of the organisms from redistribution of bottom sediment or increased turbidity from resuspended sediment may foul or otherwise interfere with filter-feeding organs.

Recruitment of new organisms from nearby communities and settlement of organisms in areas with exposed hard ground may take years to decades to become established, if ever. With this in mind, BOEM uses conditions of approval attached to permits to preserve such undisturbed areas. The conditions of approval and monitoring measures outlined in **Chapter 2.4** do not increase or decrease impacts to benthic communities for the proposed survey activities.

Sensitive sessile benthic resources could occur in the vicinity of the proposed activities; the proposed activities are not expected to impact either known or probable areas of deepwater benthic communities.

3.4.3. Cumulative Impact Analysis

Considering the location of these habitats, the operator's proposed activities would constitute the primary effect on the resources that may exist in the area of the proposed action. As such, the potential cumulative impacts from all other GOM activities would be identical to the effects described above. No significant cumulative impacts to such deepwater benthic communities would be expected as a result of the proposed activities when added to the impacts of past, present, or reasonably foreseeable activities in the area.

Conclusion

The effects of the proposed action, when viewed in light of the effects associated with other relevant activities, are not expected to impact deepwater benthic communities in the GOM. Given the scope of the proposed action and conservative nature of the applied mitigation, incremental effects from the proposed survey activities on deepwater benthic communities will be **negligible**.

The proposed activities are expected to have negligible impacts on the ecological function, abundance, productivity, and/or distribution of deepwater benthic communities given adherence to the 250 ft distancing requirements found in NTL No. 2009-G40, *Deepwater Benthic Communities*. The operator's plan proposes compliance with the regulations as clarified by NTL No. 2009-G40. Bottom disturbances from core sample placement would be sited away from any sensitive deepwater benthic communities. Any sediments or fluids that could come in contact with the organisms would be diluted to a concentration where the impact to the deepwater benthic community would be **negligible**.

3.5. ARCHAEOLOGICAL RESOURCES

3.5.1. Description

Archaeological resources are any material remains of human life or activities that are at least 50 years of age and that are of archaeological interest (30 CFR 551.1). As obligated under OCSLA regulations (30 CFR 551.6 (a) (5)), applicants are not allowed to disturb archaeological resources while conducting their survey activities. The description of archaeological resources (prehistoric and historic) can be found in Chapter 4.11 of the GOM G&G PEIS and Chapter 4.13 of the Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS. The following information is a summary of these descriptions and is incorporated by reference into this SEA.

Prehistoric

Geographic features that have a high probability for associated prehistoric sites in the northwestern and north central Gulf (from Texas to Alabama) include barrier islands and back barrier embayments, river channels and associated floodplains and terraces, and salt dome features. Also, a high probability for prehistoric resources may be found landward of a line which roughly follows the 60 m bathymetric contour, which represents the Pleistocene shoreline during the last glaciation some 12,000 years ago when the coastal area of Texas and Louisiana is generally considered to have been populated. BOEM is currently reviewing evidence to determine if a change in the currently accepted area of prehistoric site probability is warranted.

Historic

Historic archaeological resources on the OCS include shipwrecks and a single light house (Ship Shoal Light). Historic research has identified over 4,000 potential shipwreck locations in the Gulf, nearly 1,500 of which occur on the OCS (Garrison et al., 1989). The historic record, however, is by no means complete, and the current ability to predict potential sites has proven inaccurate. As demonstrated by several studies (e.g., Pearson et. al., 2003; Lugo-Fernandez et al., 2007; Krivor et al., 2011; Rawls and Bowker-Lee, 2011),

many more shipwrecks are likely to exist on the seafloor than have been accounted for in available historic literature. Currently a high-resolution remote sensing survey is the most reliable method for identifying and avoiding historic archaeological resources.

A 2003 study recommended including some deepwater areas, primarily on the approach to the Mississippi River, among those lease areas requiring archaeological investigation. With this in mind, BOEM revised its guidelines for conducting archaeological surveys in 2005 and added about 1,200 lease blocks to the list of blocks requiring an archaeological survey and assessment in advance of oil and gas industry activities. Archaeological survey blocks were further expanded in 2011 and current requirements are posted on the BOEM website under NTL No. 2005-G07 and Joint NTL No. 2011-G01. At present, high-resolution geophysical, ROV, and/or diver survey is required for all new bottom disturbing activities by the oil and gas industry. Historic shipwrecks have, with the exception of three significant vessels found by treasure salvors, been primarily discovered through oil industry sonar surveys in water depths up to 9,000 ft (2,743 m). In fact in the last five years, over four dozen potential shipwrecks have been located and several of these ships have been confirmed visually as historic vessels. Many of these wrecks were not previously suspected to exist in these areas, based on the historic record. The preservation of historic wrecks found in deep water has been outstanding because of a combination of environmental conditions and limited human access.

3.5.2. Impact Analysis

The IPF associated with the proposed action that could affect archaeological resources is seafloor disturbance from core sampling. The historically-available literature is not sufficient to identify historic shipwreck losses in the area of the proposed action as historic records of losses occurring this far offshore are not location-specific (Pearson et al., 2003; Krivor et al., 2011; Rawls and Bowker-Lee, 2011). However, if a historic resource exists in the survey area, direct physical contact with a shipwreck site could destroy fragile materials, such as hull remains or artifacts, and could disturb the site context (Atauz et al., 2006; Church and Warren, 2008).

The IPF that could be associated with accidental events include seafloor disturbances from jettisoned/lost debris. Similar to routine impacts, discarded/lost material that falls to the seabed has the potential to damage and/or disturb archaeological resources.

Chapter 4.11 of the GOM G&G PEIS contains a discussion of the potential impacts from survey operations on archaeological resources (USDOI, BOEM, 2017a). Additional information about routine impacts from oil and gas activity on archaeological resources is addressed in Chapter 4.13 of the Multisale EIS, 2018 GOM SEIS, GOM Lease Sales 259 and 261 SEIS. The following information is a summary of the impact analyses and is incorporated by reference into this SEA.

3.5.2.1. Alternative 1

If Alternative 1, the No Action Alternative, is selected the applicant would not undertake the proposed activities; therefore, the IPF to archaeological resources would not occur. For example, there would be no bottom impacts from core sampling that would result in potential loss of any known or unknown historic archaeological resource.

3.5.2.2. Alternative 2

If Alternative 2, the Proposed Action as Submitted, is selected the applicant would undertake the proposed activities, as requested and conditioned in the application. Examples of potential impacts to archaeological resources would include, but are not limited to, damage to potential archaeological resources from the proposed survey activities. The operator proposes core sampling activities at sites that may be located near potential archaeological resources which, without additional conditions of approval and monitoring measures, may lead to potential impacts to those sites.

3.5.2.3. *Alternative 3*

If Alternative 3, the Proposed Action with Conditions of Approval, is selected the applicant would undertake the proposed activities, as requested and conditioned in the application; however, the applicant would be required to undertake conditions of approval and monitoring measures as identified by BOEM. The mitigation and monitoring measures from the NMFS 2020 BO consultation and NMFS 2021 Amended ITS in Alternative 3 do not address this resource. The conditions of approval and monitoring measures outlined in **Chapter 2.4** are expected to decrease or negate the potential for impact to archaeological resources from the proposed action. For the reasons set forth below, inclusion of these measures under Alternative 3 further limits or negates potential impacts to archaeological resources.

Routine Activities

Historic modeling assumes that shipwrecks would be found closest to shore along the Federal/State boundary or within ten mi (16 km) of their reported loss location. However high-resolution geophysical data acquired by oil and gas industry remote sensing surveys now indicate that this model is too limited. For example, several vessel casualties from World War II with historically reported coordinates were later discovered well over ten mi (16 km) outside the 9-mi² area assumed to be their location by the model (Irion, 2002). An early nineteenth century steamship lost off the Texas coast was found by treasure salvors over 120 mi (193 km) from the area of its presumed loss in the Minerals Management Service model (Irion, Official Communication, 2011). These situations, coupled with the fact that no confirmed historic shipwreck sites had been found in any of the designated historic high probability area in 20 years, led to a study released in 2003 (Pearson et al., 2003) to reassess the high-probability model. Some of the recommendations of this study were implemented in July 2005 with the revision of NTL No. 2005-G07, *Archaeological Resource Surveys and Reports*, which added 1,802 lease blocks, mostly in deepwater areas in Mississippi Canyon (MC), Green Canyon (GC), and Viosca Knoll (VK) areas, to the “high-probability” block list requiring archaeological surveys.

The addition of the new blocks, the current requirement that all new bottom disturbing activity by the oil and gas industry be cleared by high-resolution geophysical, ROV, and/or diver survey, industry’s resultant survey data, and the subsequent increase in the number of shipwrecks discovered further suggests that the potential distribution of significant historic resources is wider than originally thought.

The Western and Central Gulf was traversed extensively by shipping throughout the 19th and 20th centuries as new ports developed along the Texas coast, such as Galveston (est. 1825) and Brazos Santiago (1848). With the advent of steam, oil screw, and gasoline or diesel-propelled vessels and improved navigational instruments, sailors’ options to set a course irrespective of prevailing winds and currents greatly increased expanding even further the potential for a shipwreck to have occurred in the area of the proposed action.

Impacts to a historic site could result from direct physical contact with a coring device or CPT measurement tool causing irreversible damage. The undisturbed provenience of archaeological data (i.e., the 3-dimensional location of archaeological artifacts) allows archaeologists to accumulate a record of where every item is found, and to develop a snapshot as to how artifacts relate to other items or the site as a whole. The analysis of artifacts and their provenience is one critical element used to make a determination of eligibility to the National Register of Historic Places and is essential in understanding past human behavior and ways of life. Impacts from the proposed operations could alter the provenience and destroy fragile remains, such as the hull, wood, glass, ceramic artifacts and possibly even human remains, or information related to the operation or purpose of the vessel. The destruction and loss of this data eliminates the ability of the archaeologist to fully and accurately detail activity areas found at the site, variation and technological advances lost to history, the age, function, and cultural affiliation of the vessel, and its overall contribution to understanding and documenting the maritime heritage and culture of the region. Under Alternative 3, the operator is required to avoid known archaeological resources and cease operations should the operator discover an unknown, potential archaeological resource. With the conditions of approval and monitoring measures in place under Alternative 3, the effects to archaeological resources are expected to be **negligible**.

Accidental Events

An IPF that could result from an accidental event is from the loss of debris from the survey and support vessels during survey operations. Debris such as structural components (i.e., grating, wire, tubing, etc.), boxes, pallets, and other loose items can become dislodged during heavy seas or storm events and fall to the seabed. Similar to the impacts noted under Routine Activities, if debris were to fall onto an unknown archaeological resource, damage could destroy fragile materials, such as hull remains and artifacts, and could disturb the site's context and associated artifact assemblage. Additionally, lost material could result in the masking of actual archaeological resources or the introduction of false targets that could be mistaken in the remote sensing record as historic resources.

3.5.3. Cumulative Impact Analysis

Cumulative impacts on unknown archaeological resources that may be present in the area of the proposed action could result from other GOM activities. Since the water depth of the proposed activity ranges from approximately 3,000 – 3,550 ft (914 – 1,082 m) and the area of the proposed action is over 135 mi (217 km) from shore, those activities would be limited to commercial fishing, marine transportation, and adjacent oil and gas exploration, development, and production operations.

During adjacent oil and gas operations, commercial fishing, and maritime transportation activities, there is associated loss or discard of debris that could result in the masking of archaeological resources or the introduction of false targets that could be mistaken in the remote sensing record as historic resources. Future exploration, development, and production operations and/or any related infrastructure support could lead to bottom disturbances in the area of the proposed action; however, no additional activities have been proposed or are under review at this time.

Any known or unknown archaeological resources that may be present in the proposed survey area could be impacted by contact with oil from a blowout or spill from adjacent oil and gas operations. Similarly, cumulative impacts from accidental oil spills and remediation efforts for adjacent oil and gas operations are not expected because of the water depth at the proposed site and the historically low probability of a loss of well control/blowout.

Considering the potential cumulative impacts from all other GOM activities, the operator's proposed activities would constitute the primary effect, if any, on any known or unknown archaeological resource that may exist in the area of the proposed action.

Conclusion

Based on the previous information, study conclusions, and the number of confirmed wrecks recently found in similar water depths, there is reason to believe that archaeological resources could be present in the area of the proposed action. Impacts may include damage and/or disturbance to the potential resources from coring locations and CPT measurement tools. Impacts from accidental events related to the proposed action such as debris lost from the survey and support vessels could lead to impacts similar to those expected from routine impacts. If the operator's seabed disturbing activities make contact with these targets, it might have a significant impact on the resources. The site-specific review of the proposed activity indicates that no known potential archaeological target exists in the area of the proposed coring locations. There are significant portions of the project area within the OCS that have received either limited or no previous archaeological survey. Based on the review findings, these areas could contain additional archaeological materials that may be impacted by the proposed operations. With conditions of approval and monitoring measures, selecting Alternative 3 should not result in significant impacts to archaeological resources; the effects are expected to be negligible.

3.6. OTHER CONSIDERATIONS

A discussion of the other resources considered but not analyzed under this SEA is found in Chapter 5 of the GOM G&G PEIS (USDOJ, BOEM, 2017a) and Chapter 3 of the Multisale EIS, 2018 GOM SEIS (USDOJ, BOEM, 2017b and c), and GOM Lease Sales 259 and 261 SEIS (USDOJ, BOEM, 2023).

4. CONSULTATION AND COORDINATION

The information in this SEA was developed by BOEM subject matter experts and in consultation with other Federal agencies, the private sector, and academia personnel found in Chapter 6 of the GOM G&G PEIS and Chapter 5 of the Multisale EIS, 2018 GOM SEIS (USDOJ, BOEM, 2017a, b, and c) and GOM Lease Sales 259 and 261 SEIS (USDOJ, BOEM, 2023).

The ESA establishes a national policy designed to protect and conserve threatened and endangered species and the ecosystems upon which they depend. Section 7(a)(2) of the ESA requires each Federal agency to ensure that any action that they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the adverse modification of designated critical habitat. On April 20, 2018, the FWS issued its 10-year programmatic BO (FWS 2018 BO) for BOEM and BSEE's oil and gas activities in the GOM. The FWS 2018 BO does not include any terms and conditions for the protection of endangered species that the Bureaus, lessees, or operators must implement. The FWS 2018 BO also noted that any future consultations may be informal, dependent upon the likelihood of take.

On March 13, 2020, NMFS issued a Programmatic BO (NMFS 2020 BO) and related terms and conditions for oil and gas activities in the GOM for the protection of these species, including holding lease sales. The NMFS 2020 BO and NMFS 2021 Amended ITS address any future lease sales and any approvals issued by BOEM and BSEE, under both existing and future OCS oil and gas leases in the GOM, over a 10-year period. Applicable terms and conditions and reasonable and prudent measures from the NMFS 2020 BO and NMFS 2021 Amended ITS will be applied at the lease sale stage; other specific conditions of approval will also be applied to post-lease approvals. The NMFS 2020 BO may be found here:

<https://www.fisheries.noaa.gov/resource/document/biological-opinion-federally-regulated-oil-and-gas-program-activities-gulf-mexico>.

The Appendices and protocols may be found here:

<https://www.fisheries.noaa.gov/resource/document/appendices-biological-opinion-federally-regulated-oil-and-gas-program-gulf-mexico>.

In November 2020, BOEM and BSEE in the spirit of adaptive management and in agreement with NMFS, submitted revised procedures for the NMFS 2020 BO (as amended), in that, some activities previously requiring step-down review by NMFS to not be continued and apply programmatic standardized mitigation measures to protect resources. On April 26, 2021, the NMFS 2020 BO was amended (NMFS 2021 Amended ITS) to incorporate adaptive management for step-down review, MMPA Rulemaking, and revised Appendices A, C, and I.

BOEM petitioned NMFS for rulemaking under the MMPA, to assist industry in obtaining incidental take coverage for marine mammals due to oil and gas and G&G surveys in the GOM. NMFS issued a final rule as a result of the petition on January 19, 2021 (86 FR 5322) with an effective date of April 19, 2021. The rule will be in place for five years. For G&G activity, the operator would need to obtain a Letter of Authorization (LOA) under the Incidental Take Regulation (ITR) to have any expected take of marine mammals authorized under the MMPA, and for ESA-listed species under the NMFS 2020 BO (as amended), authorized under the ESA. Any applicable mitigations would generally already be applied via the NMFS 2020 BO (as amended).

BOEM completed consultation with NOAA's NMFS regarding the MFCMA on July 10, 2017, by the receipt of a comment letter from NMFS. The NMFS letter acknowledged their receipt of the Essential Fish Habitat (EFH) Assessment and the supporting 2017-2022 Multisale Lease NEPA document, provided a determination that the Programmatic Consultation was an appropriate mechanism to evaluate EFH impacts and confirmed the adoption of the BOEM/BSEE mitigation measures outlined in the June 8, 2016 BOEM EFH Assessment to ensure adverse impacts are avoided, minimized, and offset. This consultation remains in effect for 2017-2022 activities or earlier but not if modifications are made to the BOEM/BSEE programs that would result in changes to potential adverse effects on EFH which would trigger additional consultation.

In accordance with the National Historic Preservation Act (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 National Historic Preservation Act, issued by the Advisory Council on

Historic Preservation (36 CFR § 800), specify the required review process. In accordance with 36 CFR § 800.8(c), BOEM intends to use the NEPA substitution process and documentation for preparing an EIS/ROD or an EA/FONSI to comply with Section 106 of the National Historic Preservation Act in lieu of 36 CFR § 800.3-800.6.

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