TETRA TECH

rps MAKING COMPLEX EASY
A TETRA TECH COMPANY

OCS PERMIT OCS-G 37199
ANADARKO BLACKHAWK MC 40 DRL VSP 2024
PROTECTED SPECIES OBSERVER REPORT

Final

rpsgroup.com

OCS PERMIT OCS-G 37199
ANADARKO BLACKHAWK MC 40 DRL VSP 2024
PROTECTED SPECIES OBSERVER REPORT

Final Report

Report Reviewer	
Name	Date of Review
Jason Dean	06 June 2024

Final Report Approval	
Name	Stephanie Milne
Title	Team Leader – U.S Offshore Renewables / Senior Environmental Manager
Signature	DocuSigned by: A7EB551BB693441...
Date	Jun 21, 2024

Prepared by**: Islam Ibrahim**

RPS

575 N Dairy Ashford Rd Suite 700
Houston, TX
77079

T +1 214 697 2491
E Islam.Ibrahim@tetratech.com

Prepared for**: Christopher Moyer**

ANADARKO

1201 Lake Robbins Drive
The Woodlands, TX
77380

T +1 914 602 2026
E christopher_moyer@oxy.com

Contents

Tables

Figures

Appendices

List of Acronyms

BO	Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the GOM
BOEM	Bureau for Ocean Energy Management
BZ	Buffer Zone
CPA	Closest Point of Approach
dB	Decibel
dB re 1 µPa (rms)	Decibel related to 1 micropascal (root mean square)
D/S	Drillship
DSLR	Digital Single Lens Reflex
EPU	Electronic Processing Unit
EZ	Exclusion Zone
GOM	Gulf of Mexico
HF	High Frequency
Hz	Hertz
ID	Sighting Identity
in^3	Cubic inches
kHz	Kilohertz
Km	Kilometer
LOA	Letter Of Authorization
LF	Low Frequency
m	Meters
min	Minute/s
MMPA	Marine Mammal Protection Act
NM	Nautical Miles
NMFS	National Marine Fisheries Service
OCS	Outer Continental Shelf
PAM	Passive Acoustic Monitoring
psi	Pounds per Square Inch
PSO	Protected Species Observer
RPS	PSO Provider
s	Second/s
VSP	Vertical Seismic Profile

1 EXECUTIVE SUMMARY

This report covers the protected species mitigation measures and monitoring efforts during a Vertical Seismic Profile (VSP) survey conducted on board the drillship (D/S) *Ocean Blackhawk* on 09 May 2024 to 14 May 2024. This is the first and final report for Anadarko *D/S Ocean Blackhawk* VSP, which was conducted by Schlumberger in Mississippi Canyon, Block 40, US Gulf of Mexico (GOM), under OCS-G 37199 and LOA issued 04 January 2024.

During this VSP survey, three Protected Species Observers (PSOs) and four Passive Acoustic Monitoring (PAM) Operators, all provided by RPS, were onboard the drillship *D/S Ocean Blackhawk* to undertake visual and acoustic monitoring in accordance with the Biological Opinion (BO) on the Federally Regulated Oil and Gas Program Activities in the GOM issued by the National Marine Fisheries Service (NMFS) on 13 March 2020.

During acquisition of the VSP, the seismic source on the *D/S Ocean Blackhawk* was active for a total of two hours and 50 minutes. This included two ramp-ups with a total duration of 44 minutes, one hour and 36 minutes of source testing, 20 minutes of acquisition at full source volume, and 10 minutes of full volume non-production while positioning tool at acquisition stations.

Visual observations were conducted for a total of 72 hours and acoustic PSOs conducted PAM monitoring for a total of 11 hours and eight minutes. All source activity was accompanied by visual and acoustic monitoring during the day and by acoustic monitoring during the night.

Marine mammal detections consisted of three visual sightings and zero acoustic detections. Visual detections of cetaceans consisted of one identified delphinid species: Rough-toothed dolphin (*Steno bredanensis).*

There were no observations of dead/injured protected species during the project.

In accordance with stipulations set forth under BOEM permit OCS-G 37199 and the GOM BO, a total of zero mitigation actions were implemented for the sound sources, zero delays to activation of the source.

2 INTRODUCTION

The *D/S Ocean Blackhawk* VSP survey was conducted by Schlumberger on behalf of Anadarko under Ancillary Activity Plan for OCS-G 37199 and LOA issued 04 January 2024. NMFS and Bureau for Ocean Energy Management (BOEM) have advised that sound-producing survey equipment operating in the hearing range of marine species has the potential to cause acoustic harassment, in particular to marine mammals. Protected species monitoring was conducted in accordance with BOEM and NMFS standards.

The survey company conducting operations was responsible for contracting PSOs through a provider to conduct monitoring and mitigation for protected species, including marine mammals, sea turtles, Gulf sturgeon, oceanic whitetip shark and giant manta rays during their activities. Monitoring and mitigation procedures that were implemented during the survey are described in Section 4 of this report.

2.1 BOEM Reporting Requirements

This report summarizes the information required by the BOEM permit OCS-G 37199 and LOA issued 04 January 2024 and the NMFS Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the GOM (BO) identified in Table 1.

Table 1: BOEM and NMFS Biological Opinion reporting requirements and location within this technical report

Required content	Source reference	Location addressed in technical report
BOEM		
SEISMIC SURVEY OPERATION, MONITORING, AND REPORTING GUIDELINES: The applicant will follow the guidance provided under Appendix A: 2 Seismic Survey Mitigation and Protected Species Observer Protocols, found in the Biological Opinion amendment issued by NMFS on April 26, 2021. The guidance can be accessed on the National Oceanic and Atmospheric Administration (NOAA) Fisheries internet site at https://www.fisheries.noaa.gov/resource/document/appendices-biologicalopinion-federally-regulated-oil-and-gas-program-gulf-mexico.	BOEM OCS-G 37199	This Technical Report
PSOs must use a standardized data collection form, whether hard copy or electronic. PSOs shall record detailed information about any implementation of mitigation requirements, including the distance of animals to the acoustic source and description of specific actions that ensued, the behavior of the animal(s), any observed changes in behavior before and after implementation of mitigation, and if shutdown was implemented, the length of time before any subsequent ramp-up of the acoustic source. If required mitigation was not implemented, PSOs should record a description of the circumstances.	NMFS BO Appendix A	Section 6.6 of this report
The MMPA authorization (as applicable) and BOEM Permit/Plan holder shall submit a draft comprehensive report to BOEM/BSEE (protectedspecies@boem.gov and protectedspecies@bsee.gov) and NMFS (nmfs.psoreview@noaa.gov) on all activities and monitoring results within 90 days of the completion of the survey or expiration of the MMPA authorization (as applicable) or BOEM Permit/Plan, whichever comes sooner, or if an issued MMPA authorization is valid for greater than one year, the summary report must be submitted on an annual basis,. The report must describe all activities conducted and sightings of protected species near the activities, must provide full documentation of methods, results, and interpretation pertaining to all monitoring, and must summarize the dates and locations of survey operations and all protected species sightings (dates, times, locations, activities, associated survey activities, and information regarding locations where the acoustic source was used). A final report must be submitted within 30 days following resolution of any comments on the draft report.	NMFS BO Appendix A	This Technical Report
The MMPA authorization (as applicable) and BOEM Permit/Plan holder must report sightings of any injured or dead aquatic protected species immediately, regardless of the cause of injury or death. For injured or dead non-marine mammal aquatic protected species, report incidents to the hotlines listed at https://www.fisheries.noaa.gov/report (phone numbers vary by state). For reporting dead or injured marine mammals, refer to the reporting requirements specified in the MMPA authorization (as applicable), associated with the activity being conducted.	NMFS BO Appendix A	Section 6.7 of this report

Required content	Source reference	Location addressed in technical report
NMFS and BSEE must be notified via email (nmfs.psoreview@noaa.gov and protectedspecies@bsee.gov, respectively) as soon as practicable with the time and location of any operations conducted without an active PAM system. The notification will include the vessel name, the time and location (GIS position) in which the PAM system ceased function where seismic operations continued.	NMFS BO Appendix A	Section 6.2.1 of this report
NMFS LOA		
PSOs must use standardized electronic data forms. PSOs must record detailed information about any implementation of mitigation requirements, including the distance of marine mammals to the acoustic source and description of specific actions that ensued, the behavior of the animal(s), any observed changes in behavior before and after implementation of mitigation, and if shutdown was implemented, the length of time before any subsequent ramp-up or activation of the acoustic source. If required mitigation was not implemented, PSOs must record a description of the circumstances.	NMFS LOA, Section 5 (c)	Appendix F of this report
The draft report must be accompanied by a certification from the lead PSO as to the accuracy of the report, and the lead PSO may submit directly to NMFS a statement concerning implementation and effectiveness of the required mitigation and monitoring.	NMFS LOA, Section 6 (a) v	Appendix J of this report
A final report must be submitted within 30 days following resolution of any comments on the draft report.	NMFS LOA, Section 6 (a) vi	This technical report
Reporting of injured or dead marine mammals: In the event that personnel involved in the survey activities discover an injured or dead marine mammal, the Holder must report the incident to the Office of Protected Resources (OPR), NMFS and to the Southeast Regional Stranding Network as soon as feasible. In the event of a ship strike of a marine mammal by any vessel involved in the survey activities, the LOA-holder must report the incident to OPR, NMFS and to the Southeast Regional Stranding Network as soon as feasible.	NMFS LOA, Section 6 (c) i-ii	Section 6.7 of this report

3 PROGRAM OVERVIEW

The survey area is located 97 km (52 NM) east-southeast of Louisiana, within the block of Mississippi Canyon 40, US GOM. Water depth in the project area is 4705 ft (1434 m).

Table 2: General VSP survey parameters

Survey parameters	*D/S Ocean Blackhawk*
General location	Mississippi Canyon 40, Gulf of Mexico
Water depth (m)	1434 m
Port location	New Orleans, LA

3.1 Drillship Summary

The VSP survey was undertaken from the *D/S Ocean Blackhawk*. Specifications of the drillship are provided in Table 3 and a photo is included in Appendix C. A high-level overview of survey events for each vessel is outlined in Table 4.

Table 3: Drillship specifications

Vessel name	Scope of work	Length (m)	Width (m)	Dates on project
D/S Ocean Blackhawk	VSP drillship	230	40	09 May 2024 – 14 May 2024

Table 4: Summary of key survey events by vessel on the VSP Survey.

Event	Dates
PSO team mobilizes	07 May 2024
Project kick-off meetings	26 April 2024
Seismic array testing begins	10 May 2024
VSP acquisition begins	13 May 2024
Data acquisition complete	13 May 2024

3.2 Equipment Specifications

3.2.1 Sound source equipment

The VSP was acquired using one airgun array (Appendix C), consisting of six airgun elements, deployed 28 meters off the starboard side of the vessel at a depth of 4.6 meters. Each of the six airgun elements

had a volume of 250 cubic inches (in^3) such that the total operating volume, or "full" volume, of the source array was 1500 in^3. The operating intensity was 228 bar meters at a target frequency of 65 Hz (Table 5).

Table 5: Seismic source specifications for the VSP

Source specification	*D/S Ocean Blackhawk VSP*
Total source volume (in^3)	1500
Number of source arrays	1
Total number of source elements in full volume source	6
Source depth (m)	4.6
Source distance from vessel (m)	28
Source frequency (Hz)	65
Source intensity (dB re 1µPa or bar meters)	228
Shot point interval (s)	20

4 MONITORING AND MITIGATION PROGRAM

This section describes the protected species monitoring and mitigation measures established to meet the requirements of the BOEM permit and the NMFS BO. Survey mitigation measures were designed to minimize the potential impacts of the survey activities on marine mammals, sea turtles, and other protected species of interest.

The following monitoring protocols were implemented to meet these objectives, and each are described in detail in a sub-section below:

- Visual observations were conducted during the day to provide real-time sighting data, allowing for the implementation of mitigation procedures as necessary.
- A PAM system was operated continuously day and night to augment visual observations and provide additional marine mammal detection data.
- Protected species exclusion zones (EZ) (Section 4.5) were established around the seismic sound source where delays to initiation of the source and shutdowns of the active source were implemented when protected species were detected inside.

4.1 Monitoring: PSOs and PAM Operators

There were trained and experienced PSOs on board the drillship during VSP survey activities to conduct the monitoring for protected species, record and report detections, and request mitigation actions in accordance with the established regulatory requirements and monitoring plan.

The PSO Provider (RPS) was responsible for ensuring that each PSO deployed met the minimum requirements set forth by BOEM and by NMFS, who were required to review and approve each PSO prior to their deployment as an Observer. BOEM and NMFS PSO requirements include training in protected species identification and behavior in addition to field experience in protected species observation in the Atlantic Ocean or the GOM.

RPS was responsible for the provision of training certifications and CVs to be reviewed and approved prior to deployment on the vessel.

RPS was responsible for providing the PSOs with vessel-specific and survey contractor-specific training. Environmental Project Inductions specific to the VSP survey were provided by RPS, Anadarko, and Schlumberger during project kick-off meetings, conducted prior to the start of survey operations and prior to scheduled crew changes.

All certified PSOs who were deployed during the VSP survey operations are listed in Appendix D.

4.2 Visual Monitoring: Protocols and Methods

A team of three PSOs was deployed on *D/S Ocean Blackhawk*. PSOs monitored prior to and during all seismic source operations conducted by the vessel. Visual monitoring was also conducted during all periods between source activities in order to collect additional protected species data. Two PSOs monitored at a time on a rotating watch schedule (watch periods not to exceed two hours without a minimum one-hour break, and a maximum watch duration of 12 hours within a 24-hour period).

Visual monitoring locations on the vessel were selected to maximize or in consideration of the following factors:

1. To afford PSOs a 360-degree viewpoint around the vessel and acoustic source, such that the monitoring zones around the sound source could be monitored,
2. Provide the highest vantage point possible so as to allow for monitoring out to the greatest distances around the vessel,
3. Provide shelter from inclement weather, as needed,
4. Provide real-time communication with vessel and seismic equipment operators.

PSOs conducted their visual monitoring by actively scanning with the naked eye out to the furthest observation points visible, methodically sweeping areas closer to the vessel, focusing on the EZs. PSOs conducted regular sweeps of the surrounding areas using magnification devices as described below. PSOs monitored for cues that might indicate the presence of protected species including but not limited to splashing, footprints, blows, and presence of other marine species (diving seabirds, fish feeding activity).

Table 6: Visual monitoring methodology during VSP

D/S Ocean Blackhawk	
Total number of PSOs or PSO/PAMs	7
Number of PSOs on watch - day	3
Visual monitoring equipment- Day	Handheld reticle binoculars Big Eye binoculars Digital SLR cameras
Visual monitoring conducted at night	No
Range estimation	With reticle binoculars, by relating to object at known distance
Primary monitoring location	Bridge wings (Nav deck), Top deck

Displays inside the bridge showed current information about the vessel (e.g., position, speed, heading, etc.), sea conditions (e.g., water depth, sea temperature, etc.), and weather (e.g., wind speed and direction, air temperature, etc.). Environmental conditions, along with vessel and acoustic source activity, were recorded at least once an hour, or every time there was a change of one or more of the variables.

4.2.1 Daylight Visual

The PSOs on board were equipped with 7x50 reticle binoculars, as well as Digital Single Lens Reflex (DSLR) cameras with 300mm zoom lenses to aid in visual monitoring watches conducted during the day.

Big eye binoculars (selectable 25/40 x 100mm) were installed on each of the starboard and port bridge wing of the drillship.

PSO teams used field notebooks to record data while on watch and laptops were used to enter data on breaks between watches and at the end of each day.

Range estimates were made by comparison to object of known distance, as well as with reticle binoculars. Reticle binoculars were calibrated whenever possible to ensure accuracy of distance data.

4.3 Monitoring: Passive Acoustic Monitoring Protocols and Methods

PAM was used to augment visual monitoring efforts in the detection, identification, and locating of marine mammals. Acoustic monitoring was conducted continuously day and night during all source operations and to the maximum extent possible when no operations were being undertaken.

Acoustic monitoring was undertaken by trained PAM Operators each of whom had completed a BOEM accepted PSO training course and an RPS in-house PAM training course, which includes use of the PAM systems on board a vessel offshore. PAM monitoring shifts were no longer than four hours in duration followed by at least a two-hour break.

The PAM system was installed in a location which provided space for the system, allowed for quick communication with the visual PSOs and source operators, and provided access to the vessel's instrumentation screens. Information about the vessel (e.g., position, heading, and speed), water depth, source activity, and the PAM system (e.g., cable deployments/retrievals, changes to the system, background noise score) were recorded at least once an hour, or whenever any of the parameters changed.

Acoustic monitoring for marine mammals was conducted aurally, utilizing Sennheiser headphones, and visually with the PAMGuard software program. Low to mid-frequency delphinid whistles, clicks, and burst pulses, as well as sperm whale clicks and baleen whale vocalizations, could be visualized in PAMGuard's spectrogram modules. Odontocete clicks could also be visualized in low frequency (LF) and high frequency (HF) click detector modules. Settings adjustments to amplitude range, amplitude triggers, and spectral content filters, among others, could be made in PAMGuard's spectrogram. Click detector modules to maximize the distinction between cetacean vocalizations and ambient signal were used. The map module within PAMGuard could be utilized to attempt localizing the position and range of vocalizing marine mammals. Sound recordings could be made using the HF and LF sound recording modules when potential marine mammal vocalizations were detected, or when the operator noted unknown or unusual sound sources.

4.3.1 Passive Acoustic Monitoring Parameters and Deployment

A PAM system designed to detect most species of marine mammals was installed on the *D/S Ocean Blackhawk*. The systems were developed by Seiche Measurements and consisted of the following main components: a single hydrophone static cable, a National Instrument sound buffer, a laptop computer, and a suite of analysis software. A spare system was also present on board in the event the main system components became damaged or inoperable. Figure 1 shows the Electronic Processing Unit (EPU) and array cable.

Figure 1: Electrical processing Unit and hydrophone array cable

The hydrophone array cable contained one hydrophone element (Figure 2: Diagram of hydrophone connector cable).

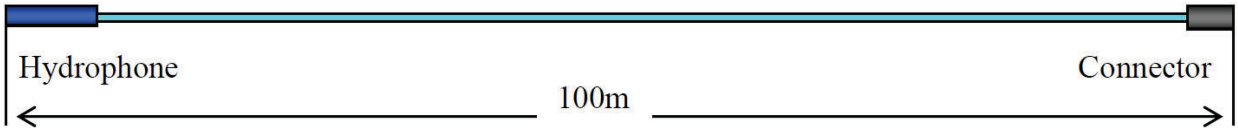


Figure 2: Diagram of hydrophone connector cable

The hydrophone array was deployed from the port aft main deck following vessel-specific deployment and retrieval procedures developed by the PAM Operator team in co-operation with relevant vessel crew. To deploy a PAM hydrophone array from *the D/S Ocean Blackhawk* the PAM operator must secure a permit which is issued by the *D/S Ocean Blackhawk* tool-pusher and approved by the safety officer and Captain/OIM. Prior to deployment or retrieval of the hydrophone cable, all relevant personnel involved attended a toolbox meeting, covering the procedures approved, as well as Anadarko, *Ocean Blackhawk*, and RPS safety requirements. The EPU was powered down prior to connection or disconnection and the hydrophone cable was disconnected to ensure the safety of the equipment.

The hydrophone array was deployed and retrieved by hand from the starboard main deck, a location that was 28 meters from the seismic array. The hydrophone cable was deployed over the handrail and secured in place such that the hydrophone element was ten meters below the lowest point of the ship's hull.

The full hydrophone deployment procedure for vessel can be found in Appendix E

4.4 Monitoring: Data Collection

During or immediately after each sighting event, the PSOs recorded the detection details in a standardized detection datasheet provided to them by RPS. Excel data forms included tabs for project data, monitoring effort data, seismic data, and protected species detection data. RPS supplied a set of standardized variables for specific data fields that were to be implemented on the data form provided to their PSOs.

Each sighting event was linked to an entry on an effort datasheet where specific environmental conditions and vessel activity were logged.

Species identifications were made whenever the distance of the animal(s), length of the sighting, and visual observation conditions allowed. Whenever possible during detections, photographs were taken with DSLR cameras that had telephoto lenses. Marine mammal identification manuals were consulted, and photos were examined during observation breaks to confirm identifications.

Identification of marine mammals, sea turtles was made or confirmed using identification guides: Guide to Marine Mammals and Turtles of the U.S. Atlantic & Gulf of Mexico (Wynne, K. and Schwartz, M. 1999); Guide to marine mammals of the world (Pieter A Folkens and Randall R Reeves); Whales, Dolphins and Seals: A Field Guide to the Marine Mammals of the World (Shirihai, H. and Jarett, B. 2006). For the identification of other wildlife, the guide used was Peterson Field Guide to Birds of North America (Peterson R., 2008).

While acoustic monitoring does not allow assessment of group size with the same level of precision as by visual observation, the LF and HF click detector modules in PAMGuard allow PAM Operators to identify when multiple animals are vocalizing simultaneously or in very close succession. Click detectors present cetacean click trains on computer displays, spatially differentiated by relative bearings to the hydrophone array, so when multiple click trains occur simultaneously or in close succession, and the click trains come from different bearings, the PAM Operator knows the click trains originate from different animals. While this does not allow the PAM Operator to estimate a total group size, it does provide the PAM Operator an estimate for the minimum group size.

4.4.1 Data Collection Requirements & Methods

Data was collected to meet the requirements of BOEM, and the NMFS BO as summarized in Table 1 of this report.

PSOs and PAM Operators collected data in handwritten notepads or on portable / tablet devices during watches. During watch breaks and at the end of daylight hours, data was compiled in proprietary data forms on laptop computers and backed up on portable hard drives.

4.5 Mitigation Methodology

The following mitigation actions were required for visual and acoustic detections of protected species, including marine mammals and sea turtles:

- Establishment of Buffer Zone (BZ) around seismic array
  - 500-meter BZ for all true whales
  - 200-meter BZ for all other marine mammals and sea turtles
- Establishment of Exclusion Zone (EZ) around seismic array
  - 500-meter EZ for all true whales
  - 100 meters for all other marine mammals and sea turtles
- Search periods of 30 minutes conducted visually and acoustically (daytime) or acoustically (all periods of reduced visibility, including night) prior to the initiation of the acoustic array from silence.
- If marine mammals or sea turtles were detected inside their respective BZ during the search period prior to the initiation of the source, delays to the initiation of the sound source were implemented until all animals had been observed exiting the BZ, or when the animals were not observed exiting, 15 minutes for small odontocetes and 30 minutes for all other marine mammals and sea turtles were implemented. All delays for acoustic-only detections were for 30 minutes.

- Shut down of the active source upon detection of marine mammals inside their respective EZ. Shut down was not required for dolphins of the genera *Steno, Tursiops, Stenella, and Lagenodelphis*. In the event of an acoustic detection of dolphins inside the EZ, unless a visual observer or PAM Operator could confirm that the animals detected were not of one of the four shutdown-exempted genera listed above, the detection was assumed to have been of one of those genera, and no shutdown was required.
- Once the sound source had been shut down for a protected species detection, operations would resume with ramp-up after either all animals were observed exiting the exclusion zone, or when they were not observed exiting, 30 minutes had passed.

4.6 PSO Briefing

A PSO Briefing, meeting the requirements of the BO, was conducted on the *D/S Ocean Blackhawk* on 10 May 2024, prior to commencement of this survey where the PSO-PAM team, survey crew, marine crew, client representatives, and the other members of the crew involved in survey operations attended. The purpose of this meeting was to discuss mitigation protocols, roles and responsibilities, the authority of PSO/PAM to call for delays and shutdowns, specific communication protocols and language to be used, as well as the requirement for clearance requests to be made to PSO/PAM before initiating the airguns from silent periods of any length. A list of attendees may be found in Appendix G.

4.7 Reporting

Reporting requirements of the BOEM permit and the NMFS BO were outlined in A Letter of Authorization from NMFS was applied to the survey and referenced in Table 1. Both agencies require that a final PSO survey report to be prepared detailing survey operations, monitoring effort, and detection of protected species.

4.7.1 Injured or Dead Protected Species

Any injured or dead marine mammal or sea turtle observed either by a PSO on watch or by a crew member was required be reported to BOEM and NMFS as described in Table 1. Reporting requirements included a phone notification to the NMFS Regional Stranding hotline as soon as practicably possible, made by either the Lead PSO or shore based PSO Provider, as communications permitted from the vessel.

The Lead PSO would also prepare a written report in accordance with NMFS standard reporting guidelines and using the template provided by BOEM in the lease, which would be submitted to Anadarko for submittal to the agencies.

4.7.2 Non-functioning PAM System During Source Activity

RPS has prepared reports for each PAM outage event during source activity to meet the GOM BO report requirements outlined in Table 1 of this report. PAM outage reports for the *D/S Ocean Blackhawk* were submitted to Anadarko, NMFS, and BOEM on the day of the event. During the survey, there were no PAM outages that required reporting to NMFS and BOEM.

4.7.3 Final Report

RPS has prepared this Technical Report to meet the BOEM lease reporting requirements outlined in Table 1 of this report. A Letter of Authorization from NMFS was applied for but at the time of issuance of the report, has not yet need issued.

5 DATA RECORDS AND ANALYSIS METHODS

5.1 Operation Activity

PSOs and PAM Operators collected the seismic source's operational status each day that they were deployed on the vessel.

5.2 Monitoring Effort

PSOs and PAM Operators recorded monitoring effort by entering start of watch and end of watch times into data sheets where the vessel position and environmental data was also documented for that duration.

Total monitoring effort was calculated by summing the durations of each watch period. The monitoring effort entry also indicated the source status for that monitoring period.

Visual monitoring while the acoustic source was off included monitoring conducted prior to the start of VSP operations and any other recorded silent periods (mitigation action, equipment downtime, or weather standby time).

5.2.1 Summary of Environmental Conditions

Each PSO monitoring effort data form included environmental conditions present during that watch period. Environmental variables were recorded every 30 to 60 minutes or when conditions changed.

Beaufort sea state was recorded for each monitoring period using the accepted scale (Table 7):

Table 7: Beaufort sea state scale

Beaufort number	Description	Wave height	Sea conditions
0	Calm	0 m	Sea like a mirror
1	Light air	0–0.3 m	Ripples with appearance of scales are formed, without foam crests
2	Light breeze	0.3–0.6 m	Small wavelets still short but more pronounced; crests have a glassy appearance but do not break
3	Gentle breeze	0.6–1.2 m	Large wavelets: crests begin to break; foam of glassy appearance; perhaps scattered white horses
4	Moderate breeze	1–2 m	Small waves becoming longer; fairly frequent white horses
5	Fresh breeze	2–3 m	Moderate waves taking a more pronounced long form; many white horses are formed; chance of some spray
6	Strong breeze	3–4 m	Large waves begin to form; the white foam crests are more extensive everywhere; probably some spray
7	High wind,	4–5.5 m	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind; spindrift begins to be seen
8	Gale	5.5–7.5 m	Moderately high waves of greater length; edges of crests break into spindrift; foam is blown in well-marked streaks along the direction of the wind
9	Severe gale	7–10 m	High waves; dense streaks of foam along the direction of the wind; sea begins to roll; spray affects visibility

10	Storm	9–12.5 m	Very high waves with long overhanging crests; resulting foam in great patches is blown in dense white streaks along the direction of the wind; on the whole the surface of the sea takes on a white appearance; rolling of the sea becomes heavy; visibility affected
11	Violent storm	11.5–16 m	Exceptionally high waves: small- and medium-sized ships might be for a long time lost to view behind the waves; sea is covered with long white patches of foam; everywhere the edges of the wave crests are blown into foam; visibility affected
12	Hurricane force	>14 m	The air is filled with foam and spray; sea is completely white with driving spray; visibility very seriously affected

The swell heights were categorized: less than 2 meters, 2 to 4 meters, and greater than 4 meters.

PSOs categorized visibility during visual monitoring effort in kilometers and/or meters as less than 500 meters, 500 meters to 1 kilometer, 1 to 2 kilometers, 2 to 5 kilometers and greater than 5 kilometers.

5.3 Visual Sightings of Protected Species

PSOs used standardized reporting forms provided by RPS to record all detections of marine mammals and sea turtles made during survey operations. These records were completed any time a sighting was made, regardless of distance, not just for detections where mitigation was implemented.

Sighting identity (ID) or detection event numbers were assigned chronologically for all protected species observed. A new detection number was assigned for a new species sighting or when enough time had passed between observations of animals of the same species such that PSOs could not be certain that they were observing the same animals previously documented. A standard duration of time was to be applied between observations: 15 minutes for delphinid detections and 30 minutes for large whales. If there were multiple species in a single detection, the same sighting ID or detection event was used.

Protected species movement relative to the vessel, pace, and initial and subsequent behavior states were recorded for each protected species sighting where standardized categories for each were provided as controlled fields in the provided data form.

5.3.1 Closest point of approach

All PSOs recorded Closest Point of Approach (CPA), if the source was deployed at time of detection, and the source status at the CPA.

5.4 Acoustic Detections

PAM Operators used standardized reporting forms provided by RPS to record all acoustic detections of marine mammals. These records were completed any time an acoustic detection was made, not just for detections where mitigation was implemented.

Detection ID or detection event numbers were assigned chronologically for acoustic detections on a vessel throughout that vessel's survey activity. A new detection number was assigned for a new species detection or when enough time had passed between detection cues of animals of the same species such that PAM Operators could not be certain that they were detecting the same animals as previously documented. A standard duration of time was to be applied between observations: 15 minutes for delphinid detections and 30 minutes for large whales.

The method/modules on which vocalizations were detected and the method used for distance estimation was recorded for every event where standardized categories for each were provided as controlled fields in the provided data form.

5.5 Correlated Visual and Acoustic Detections

Any visual and acoustic detection event of the same species/species group that overlapped in time (period of time between initial and final detection), was recorded as a correlated visual and acoustic detection. The time at first and last detection was recorded for each detection method and the method that initial detection was made was also recorded where PSO/PAM selected from controlled fields that included each detection method as well as whether the detection had been communicated to the other person on watch (PSO or PAM).

5.6 Mitigation Measures Implemented

Mitigation measures were implemented as previously described. The PSO team communicated and requested mitigation in real time to the seismic source operators. Communications were conducted over handheld radios or in person.

Implemented mitigation actions were recorded on PSO data sheets in the detection data form and in the operations activity logs.

For each mitigation action, the mitigation downtime associated with that action was calculated. Mitigation downtime was the duration of the break in source operations as required by the regulatory protocols: the duration of time that an animal was observed inside an EZ and any additional clearance time required before source could be activated. Mitigation downtime did not include any additional downtime that a survey operator needed in order to resume acquisition.

6 RESULTS

This section of the report details source operations, protected species monitoring effort, environmental conditions during monitoring effort and distribution, and detection data.

The monitoring effort, source operations and protected species detections for the project vessel are provided as an excel file as Appendix F.

6.1 Operations Summary

Survey operations began three days after the PSO-PAM and survey teams mobilized to the vessel via helicopter. A breakdown of source operations can be found in Table 8.

Table 8: Summary of seismic source operations aboard the *D/S Ocean Blackhawk*

Source status	Duration (hh.hh)
Testing at reduced source volume	00.00
Testing at full source volume	01.60
Ramp-up	00.73
Full volume while not acquiring production data	00.17
Full volume while acquiring production data	00.33
Total source activity	**02.83**

6.2 Monitoring Effort

Visual and acoustic monitoring effort is summarized in Table 9.

Table 9: Summary of monitoring effort, visual and acoustic, by source activity status

Drillship	Source Active		Source Inactive		All Source Statuses	
	Duration (hh.hh)		Duration (hh.hh)		Duration (hh.hh)	
	Visual	PAM	Visual	PAM	Visual	PAM
D/S Ocean Blackhawk	02.83	02.83	69.17	08.30	72.00	11.13

6.2.1 PAM Outages

There were no PAM outages that met the requirements to be recorded and reported as described in the BO during this survey.

6.3 Environmental Conditions

Environmental conditions can have an impact on the probability of detecting protected species in a survey area, especially visibility, swell and Beaufort Sea state.

Most of the monitoring effort (80%) for the survey was undertaken in conditions where visibility extended to greater than 5 kilometers, this is summarized in Table 10.

Table 10: Summary of visibility during visual monitoring effort

Visibility	Duration (hh.hh)	% of Overall monitoring effort
Greater than 5 km	57.34	80
2 to 5 km	10.54	15
Less than 2 km	3.32	5

Monitoring effort was conducted in Beaufort sea states ranging from Level 3 through Level 5, but the majority of the monitoring effort was accumulated at sea states Level 4. Visual observations at Level 4 Beaufort Sea states accounted for 52% of the total visual monitoring effort, as summarized in Table 11.

Table 11: Summary of Beaufort sea sate during visual monitoring during the survey

Beaufort sea state	Duration (hh.hh)	% of Overall monitoring effort
B3	24.00	33
B3 or Less	**24.00**	**33**
B4	37.50	52
B5	10.50	15
B4 to B5	**48:00**	**67**

Swell heights during visual observations were less than two meters for 93% monitoring effort as summarized in (Table 12).

Table 12: Summary of swell height during visual monitoring during the survey

Swell height	Duration (hh.hh)	% of overall monitoring effort
Less than 2 meters	67.00	93
2 to 4 meters	05.00	7

Precipitation may also obscure visibility and sea surface. However, light rain, and haze, only attributed to 28% of the total visual effort Table 13. These conditions did not affect visibility to a point where operations had to be suspended.

Table 13. Summary of precipitation during visual monitoring during the survey

Precipitation	*D/S Ocean Blackhawk*	Percent of Total Project
	Duration (hh.hh)	%
Clear	51.50	72
Light Rain	01.50	2
Haze	19.00	26
Total	**72.00**	**100**

Glare may also obscure visibility and sea surface. For the majority of the survey 72%, visibility was affected by moderate to severe glare (Table 14). These conditions did not affect visibility to a point where operations had to be suspended.

Table 14. Summary of glare during visual monitoring during the survey

Glare	*D/S Ocean Blackhawk*	Percent of Total Project
	Duration (hh.hh)	%
None	19.85	28
Mild	19.70	27
Moderate	17.45	24
Severe	15.00	21
Total	**72.00**	**100**

6.4 Visual Sightings

This section of the report summarizes visual sightings of protected species made during the survey. There were three protected species detections. Detections consisted of one marine mammal species.

A table of all protected species sightings is provided as part of an excel datasheet attachment in Appendix F. Photographs of the protected species visually detected during the survey are provided in Appendix I.

Table 15 shows the total number of detection records and the number of individuals detected for each protected species during the survey. The locations of these detections, can be found in Figure 3.

Table 15: Detection records collected for each protected species visually detected during the survey

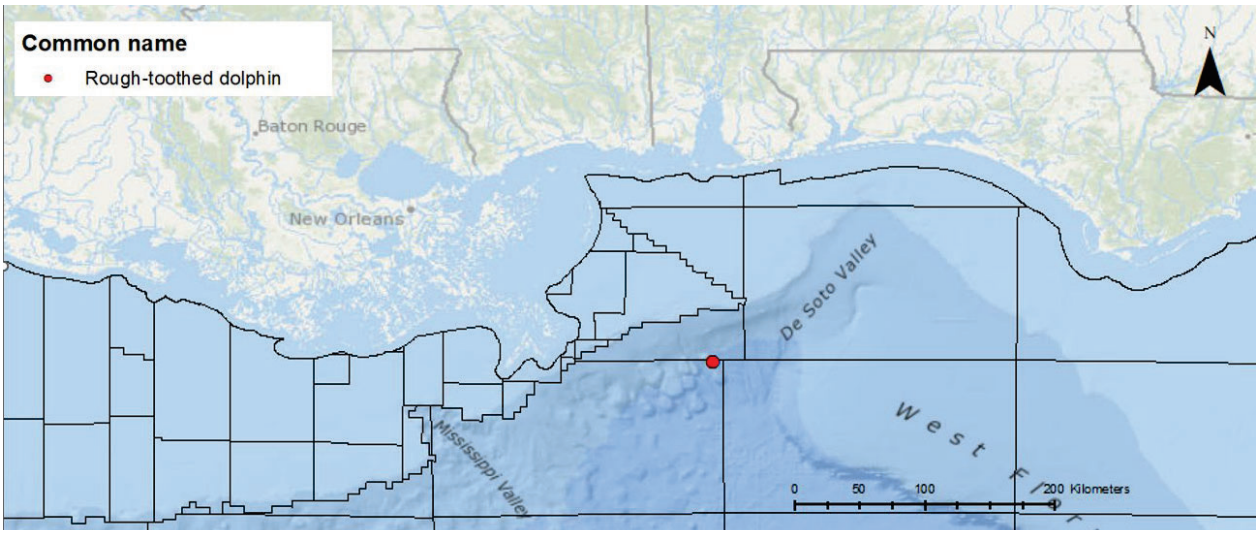
	Records	Total Number of Animals
Rough-toothed dolphin	3	101
Total Dolphin	**3**	**101**

6.4.1 Detection and Distance Summaries

The only species detected was the Rough-toothed dolphin (3 detections of 101 estimated individuals). The number of detection events, approximate number of animals observed, range of group sizes, mean group size, mean distance from vessel at first detection, and detection rate for each protected species detected over the course of the survey is provided for dolphins in Table 16.

Table 16: Detection summary of dolphins observed during the survey

Dolphins	Rough-toothed dolphin
# of Detection Records	3
Estimated # of Individuals Detected	101
Range of Group Size	64
Mean Group Size	33.7
Mean Distance (m) at First Detection	83.3
Detection Rate	0.6



The difference between the closest observed approach of marine mammals to the source is displayed in (Table 17). Detections only occurred when the source was not deployed.

Table 17: Average CPA of protected species to seismic sources or vessel, while active and inactive

Species Detected	Source Deployed – Active		Source Deployed – Inactive		Source Not Deployed	
	Number of detections	Mean closest observed approach to source (m)	Number of detections	Mean closest observed approach to source (m)	Number of detections	Mean closest observed approach to vessel (m)
Rough-toothed dolphin	0	0	0	0	3	83.3
Total Dolphin	0	0	0	0	3	83.3

6.5 Acoustic Detections

There were zero acoustic detections of marine mammals associated with the survey.

6.6 Summary of Mitigation Measures Implemented

There were zero delays and zero shutdowns to source activity for protected species detections.

6.7 Protected Species Incident Reporting

There were no observations of dead or injured protected species during the survey.

Appendix A: NMFS Biological Opinion and NMFS Letter of Authorization

Appendix A: Seismic Survey Mitigation and Protected Species Observer Protocols

This Appendix has been revised as of April 26, 2021, and replaces the original Appendix C (dated March 13, 2020). These protocols will be implemented by the Bureau of Ocean Energy Management (BOEM), the Bureau of Safety and Environmental Enforcement (BSEE), and provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361-1423h). The measures contained herein apply to all seismic surveys approved by BOEM and associated with the federally regulated oil and gas program in the Gulf of Mexico.

Background

Geophysical surveys, including the use of airguns and airgun arrays may have an impact on marine wildlife. Many marine species are protected under the Endangered Species Act (ESA) and all marine mammals (including manatees) are protected under the Marine Mammal Protection Act (MMPA). The following Gulf of Mexico species are listed under the ESA:

ESA-listed Species common to the Gulf of Mexico
Gulf of Mexico Bryde's Whale (*Balaenoptera edeni*)
Sperm Whale (*Physeter macrocephalus*)
Green Turtle (*Chelonia mydas*) – North Atlantic DPS and South Atlantic DPS
Hawksbill Turtle (*Eretmochelys imbricata)*
Kemp's Ridley Turtle (*Lepidochelys kempii*)
Leatherback Turtle (*Dermochelys coriacea*) - Northwest Atlantic DPS
Loggerhead Turtle (*Caretta caretta*) – Northwest Atlantic Ocean DPS
Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)
Oceanic Whitetip Shark (*Carcharhinus longimanus*)
Giant Manta Ray (*Manta birostris*)
West Indian Manatee (*Trichechus manatus*)*

**Managed by the US Fish and Wildlife Service*

Note that this list can change as other species are listed/delisted, and this protocol shall be applied to any ESA-listed protected species (and all marine mammals) that occur in the Gulf of Mexico, including rare and extralimital species.

BSEE and BOEM consult jointly with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (FWS) under Section 7 of the ESA to ensure that BOEM- or BSEE-authorized activities do not jeopardize the continued existence of ESA-listed species nor result in destruction or adverse modification of designated critical habitat. Incidental take of ESA-listed species is prohibited except as authorized pursuant to an Incidental Take Statement in the attached Biological Opinion. Incidental take of ESA-listed marine mammals cannot be exempted under the ESA unless also authorized under the MMPA. In this case, NMFS is

developing an incidental take regulation (ITR) to facilitate subsequent issuance of MMPA authorization (as applicable) to operators to authorize take incidental to seismic surveys. The proposed regulations would establish a framework for authorization of incidental take by Level A and Level B harassment through MMPA authorization (as applicable). Once an ITR and subsequent LOA is complete, the Biological Opinion and associated Incidental Take Statement may be amended to exempt take for Gulf of Mexico Bryde's whale and sperm whale, which are listed under the ESA. Following development of the ITRs, implementation could occur via issuance of MMPA authorization (as applicable and as Letters of Authorization [LOAs]) upon request from individual industry applicants planning specific seismic survey activities.

These protocols are the result of coordination between BOEM, BSEE, and NMFS and are based on: past and present mitigation measures; terms and conditions and reasonable and prudent measures identified in the attached Biological Opinion issued to the Bureaus; conditions, mitigation, monitoring, and reporting requirements identified in the MMPA ITR (50 CFR part 217 Subpart S); and NMFS' technical memorandum on standards for a protected species observer and data management program (Baker et al. 2013). BSEE is tasked as the lead agency for compiling lessee or operator reporting data required under current Biological Opinions applicable to both Bureaus. Therefore, while BOEM is issuing these protocols, all observer reports described herein must be submitted to BSEE as well as to NMFS where specified.

In order to protect ESA-listed species and marine mammals during seismic operations, seismic operators will be required to use protected species observers (PSOs) and follow specific seismic survey protocols when operating. These measures contained herein apply to all on-lease ancillary activity surveys conducted under 30 CFR Part 550 and all off-lease surveys conducted under 30 CFR Part 551, regardless of water depth. Operators must demonstrate your compliance with these requirements by submitting to BSEE and NMFS reports asdetailed below.

Definitions

Terms used in these protocols have the following meanings:

1. Protected species means any species listed under the ESA and/or protected by the MMPA. The requirements discussed herein focus on marine mammals and sea turtles since these species are the most likely to be observed during seismic surveys. However, other ESA-listed species (e.g., giant manta rays) are also protected and observations of them should be reported as detailed below.
2. Airgun means a device that releases compressed air into the water column, creating an acoustical energy pulse with the purpose of penetrating the seafloor.
3. Deep penetration surveys are defined as surveys using airgun arrays with total volume greater than 1,500 in^3.These surveys may in some cases collect return signals using sensors incorporated into ocean-bottom cables (OBC) or autonomous

ocean-bottom nodes (OBN) placed on the seafloor. These surveys are also referred to as high energy surveys.

4. Shallow penetration surveys are defined as surveys using airgun arrays with total volume equal to or less than 1,500 in^3, single airguns, boomers, or equivalent sources. These surveys are also referred to as low energy surveys.
5. Ramp-up (sometimes referred to as "soft start") means the gradual and systematic increase of emitted sound levels from an airgun array. Ramp-up begins by first activating a single airgun of the smallest volume, followed by doubling the number of active elements in stages until the full complement of an array's airguns are active. Each stage should be approximately the same duration, and the total duration should not be less than approximately 20 minutes for deep penetration surveys.
6. Shutdown of an airgun array means the immediate de-activation of all individual airgun elements of the array.
7. Exclusion zone means the area to be monitored for possible shutdown in order to reduce or eliminate the potential for injury of protected species. Two exclusion zonesare defined, depending on the species and context.
8. Buffer zone means an area beyond the exclusion zone to be monitored for the presence of protected species that may enter the exclusion zone. During pre-clearance monitoring (i.e., before ramp-up begins), the buffer zone also acts as an extension of the exclusion zone in that observations of marine mammals and sea turtles within the buffer zone would also prevent airgun operations from beginning (i.e. ramp-up). The buffer zone is not applicable for contexts that require an exclusion zone beyond 500 meters. The buffer zone encompasses the area at and below the sea surface from the edge of the 0– 500 meter exclusion zone, out to a radius of 1000 meters from the edges of the airgun array (500–1,000 meters) The buffer zone is not applicable when the exclusion zone is greater than 500 meters, *i.e.*, the observational focal zone is not increased beyond 1,500 meters.
9. Visual monitoring means the use of trained protected species observers (herein referred to as visual PSOs) to scan the ocean surface visually for the presence of protected species. These observers must have successfully completed a visual observer training program as described below. The area to be scanned visually includes primarily the exclusion zone, but also the buffer zone. Visual monitoring of the exclusion zones and adjacent waters is intended to establish and, when visual conditions allow, maintain zones around the sound source that are clear of marine mammals and sea turtles, thereby reducing or eliminating the potential for injury. Visual monitoring of the buffer zone is intended to (1) provide additional protection to marine mammals and sea turtles and awareness and potential protection of other visual protected species that may be in the area during pre-clearance, and (2) during airgun use, aid in establishing and maintaining the exclusion zone by alerting the visual observer and crew of marine mammals and sea turtles that are outside of, but may approach and enter, the exclusion zone.
10. Acoustic monitoring means the use of trained personnel (sometimes referred to as

passive acoustic monitoring (PAM) operators, herein referred to as acoustic PSOs) to operate PAM equipment to acoustically detect the presence of marine mammals. These observers must have successfully completed a passive acoustic observer training program as described below. Acoustic monitoring is intended to further support visual monitoring in maintaining an exclusion zone around the sound source that is clear of marine mammals, in part for the purpose of reducing or eliminating the potential for injury. In cases where visual monitoring is not effective (e.g., due to weather, nighttime), acoustic monitoring may be used to allow certain activities to occur, as further detailed below.

General Requirements

1. A copy of a MMPA incidental take authorization (as applicable) and BOEM-approved Permit/Plan must be in the possession of the vessel operator, other relevant personnel, the lead PSO (see description below), and any other relevant designees operating under the authority of the MMPA authorization (as applicable) and BOEM Permit/Plan.
2. The MMPA authorization holder (as applicable) and BOEM-approved Permit/Plan holder shall instruct relevant vessel personnel with regard to the authority of the protected species monitoring team (PSO team), and shall ensure that relevant vessel personnel and the PSO team participate in a joint onboard briefing (hereafter PSO briefing) led by the vessel operator and lead PSO to ensure that responsibilities, communication procedures, protected species monitoring protocols, operational procedures, and MMPA authorization (as applicable) and BOEM Permit/Plan requirements are clearly understood. This PSO briefing must be repeated when relevant new personnel join the survey operations before work commences.
3. The acoustic source must be deactivated when not acquiring data or preparing to acquire data, except as necessary for testing. Unnecessary use of the acoustic source must be avoided. For surveys using airgun arrays as the acoustic source notified operational capacity (not including redundant backup airguns) must not be exceeded during the survey, except where unavoidable for source testing and calibration purposes. All occasions where activated source volume exceeds notified operational capacity must be communicated to the PSO(s) on duty and fully documented. The lead PSO must be granted access to relevant instrumentation documenting acoustic source power and/or operational volume.

Protected Species Observers (PSOs, Visual and Acoustic)

Qualifications

1. The MMPA authorization (as applicable) and BOEM-approved Permit/Plan holder must use independent, dedicated, trained visual and acoustic PSOs, meaning that the PSOs must be employed by a third-party observer provider, may have no tasks other than to conduct observational effort (visual or acoustic), collect data, and communicate

with and instruct relevant vessel crew with regard to the presence of protected species and mitigation requirements (including brief alerts regarding maritime hazards), and must have successfully completed an approved PSO training course appropriate for their designated task (visual or acoustic). Acoustic PSOs are required to complete specialized training for operating PAM systems and are encouraged to have familiarity with the vessel with which they will be working. PSOs can act as acoustic or visual observers (but not at the same time) as long as they demonstrate to NMFS (nmfs.psoreview@noaa.gov) that their training and experience are sufficient to perform necessary tasks. NMFS must review and approve PSO resumes accompanied by a relevant training course information packet that includes the name and qualifications (i.e., experience, training completed, or educational background) of the instructor(s), the course outline or syllabus, and course reference material as well as a document stating successful completion of the course. NMFS shall have one week to approve PSOs from the time that the necessary information is submitted by the BOEM-approved Permit/Plan holder, after which PSOs meeting the minimum requirements shall automatically be considered approved.

2. At least one visual and two acoustic PSOs (when required) aboard the vessel must have a minimum of 90 days at-sea experience working in those roles, respectively, with no more than 18 months elapsed since the conclusion of the at-sea experience. One visual PSO with such experience shall be designated as the lead for the entire protected species observation team. The lead shall coordinate duty schedules and roles for the PSO team and serve as primary point of contact for the vessel operator (the responsibility of coordinating duty schedules and roles may instead be assigned to a shore-based, third-party monitoring coordinator). To the maximum extent practicable, the lead PSO shall devise the duty schedule such that experienced PSOs are on duty with those PSOs with appropriate training but who have not yet gained relevant experience.
    a. PSOs must successfully complete relevant training, including completion of all required coursework and passing (80 percent or greater) a written and/or oral examination developed for the training program. PSOs must have successfully attained a bachelor's degree from an accredited college or university with a major in one of the natural sciences, a minimum of 30 semester hours or

equivalent in the biological sciences, and at least one undergraduate course in math or statistics. The educational requirements may be waived if the PSO has acquired the relevant skills through alternate experience. Requests for such a waiver shall be submitted by the BOEM-approved Permit/Plan holder to NMFS (nmfs.psoreview@noaa.gov) and must include written justification. Requests shall be granted or denied (with justification) by NMFS within one week of receipt of submitted information. Alternate experience that may be considered includes, but is not limited to: (1) secondary education and/or experience comparable to PSO duties; (2) previous work experience conducting academic, commercial, or government-sponsored protected species surveys; or (3) previous work experience as a PSO; the PSO should demonstrate good standing and consistently good performance of PSO duties.

Equipment

The MMPA incidental take authorization (as applicable) and BOEM-approved Permit/Plan holder is required to:

1. Provide PSOs with bigeye binoculars (e.g., 25 x 150; 2.7 view angle; individual ocular focus; height control) of appropriate quality solely for PSO use. These shall be pedestal-mounted on the deck at the most appropriate vantage point that provides for optimal sea surface observation, PSO safety, and safe operation of the vessel.
2. Work with the selected third-party observer provider to ensure PSOs have all equipment (including backup equipment) needed to adequately perform necessary tasks, including accurate determination of distance and bearing to observed protected species. Such equipment, at a minimum, shall include:
    a. Each vessel requiring PAM will include a passive acoustic monitoring system that has been verified and tested by an experienced acoustic PSO that will be using it during the trip for which monitoring is required.
    b. Reticle binoculars (e.g., 7 x 50) of appropriate quality (at least one per PSO, plus backups)
    c. Global Positioning Units (GPS) (plus backup)
    d. Digital camera with a telephoto lens (the camera or lens should also have an image stabilization system) that is at least 300 mm or equivalent on a full-frame single lens reflex (SLR) (plus backup)
    e. Radios for communication among vessel crewand PSOs (at least one per PSO, plus backups)
    f. Any other tools necessary to adequately perform necessary PSO tasks.

    Equipment specified in (a) through (g) above may be provided by an individual PSO, the third-party observer provider, or the MMPA authorization (as applicable) and BOEM-approved Permit/Plan holder but the latter is responsible for ensuring PSOs have the proper equipment required to perform the duties specified within these protocols.

Data Collection

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

1. BOEM Permit/Plan number;
2. Vessel names (source vessel and other vessels associated with survey), vessel size and type, maximum speed capability of vessel, port of origin, and call signs;
3. PSO names and affiliations;
4. Dates of departures and returns to port with port name;
5. Date and participants of PSO briefings (as discussed in General Requirements. 2);
6. Dates and times (Greenwich Mean Time) of survey effort and times corresponding with PSO effort;
7. Vessel location (latitude/longitude) when survey effort began and ended and vessel location at beginning and end of visual PSO duty shifts;
8. Vessel heading and speed at beginning and end of visual PSO duty shifts and upon any line change;
9. Environmental conditions while on visual survey (at beginning and end of PSO shift and whenever conditions changed significantly), including BSS and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon;
10. Factors that may have contributed to impaired observations during each PSO shift change or as needed as environmental conditions changed (e.g., vessel traffic, equipment malfunctions);
11. Survey activity information, such as acoustic source power output while in operation, number and volume of airguns operating in the array, tow depth of the array, and any other notes of significance (i.e., pre-clearance, ramp-up, shutdown, testing, shooting, ramp-up completion, end of operations, streamers, etc.); and
12. Upon visual observation of any protected species, the following information:
    a. Watch status (sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform);
    b. PSO who sighted the animal;
    c. Time of sighting;
    d. Vessel location (coordinates) at time of sighting;
    e. Water depth;
    f. Direction of vessel's travel (compass direction);
    g. Direction of animal's travel relative to the vessel;
    h. Pace of the animal;

i. Estimated distance to the animal and its heading relative to vessel at initial sighting;

j. Identification of the animal (e.g., genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix ofspecies;

k. Estimated number of animals (high/low/best);

l. Estimated number of animals by cohort (adults, juveniles, group composition, etc.);

m. Description (as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics);

n. Detailed behavior observations (e.g., number of blows/breaths, number of surfaces, breaching, spyhopping, diving, feeding, traveling; as explicit and detailed as possible; note any observed changes in behavior), including an assessment of behavioral responses to survey activity;

o. Animal's closest point of approach (CPA) and/or closest distance from any element of the acoustic source;

p. Platform activity at time of sighting (e.g., deploying, recovering, testing, shooting, data acquisition, other); and

q. Description of any actions implemented in response to the sighting (e.g., delays, shutdown, ramp-up) and time and location of the action.

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

    a. An acoustic encounter identification number, and whether the detection was linked with a visual sighting;

    b. Date and time when first and last heard;

    c. Types and nature of sounds heard (e.g., clicks, whistles, creaks, burst pulses, continuous, sporadic, strength of signal);

    d. Any additional information recorded such as water depth of the hydrophone array, bearing of the animal to the vessel (if determinable), species or taxonomic group (if determinable), spectrogram screenshot, and any other notable information.

Deep Penetration Seismic Survey Protocols

Visual Monitoring

1. During survey operations (e.g., any day on which use of the acoustic source is planned to occur, and whenever the acoustic source is in the water, whether activated or not), a minimum of two visual PSOs must be on duty and conducting visual observations at all times during daylight hours (i.e., from 30 minutes prior to sunrise through 30 minutes following sunset).
2. Visual monitoring must begin no less than 30 minutes prior to ramp-up and must

continue until one hour after use of the acousticsource ceases or until 30 minutes past sunset.

3. Visual PSOs shall coordinate to ensure 360° visual coverage around the vessel from the most appropriate observation posts, and shall conduct visual observations using binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner.
4. PSOs shall establish and monitor applicable exclusion and buffer zones. These zones shall be based upon the radial distance from the edges of the airgun array (rather than being based on the center of the array or around the vessel itself). During use of the acoustic source (i.e., anytime the acoustic source is active, including ramp-up), occurrences of protected species within the buffer zone (but outside the exclusion zone) should be communicated to the operator to prepare for the potential shutdown for marine mammals (or voluntary pause for other non-marine mammal protected species [e.g., sea turtles] if being employed) of the acoustic source.
5. Visual PSOs shall immediately communicate all observations to the on duty acoustic PSO(s), including any determination by the PSO regarding species identification, distance, and bearing and the degree of confidence in the determination.
6. Any observations of protected species by crew members aboard any vessel associated with the survey shall be relayed to the PSO team.
7. During good conditions (e.g., daylight hours; Beaufort sea state (BSS) 3 or less), visual PSOs shall conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and without use of the acoustic source and between acquisition periods, to the maximum extent practicable.
8. Visual PSOs may be on watch for a maximum of two consecutive hours followed by a break of at least one hour between watches and may conduct a maximum of 12 hours of observation per 24-hour period. Combined observational duties (visual and acoustic but not at same time) may not exceed 12 hours per 24-hour period for any individual PSO. NMFS may grant an exception for LOA applications that demonstrate such a "two hours on/one hour off" duty cycle is not practicable, in which case visual PSOs will be subject to a maximum of four consecutive hours on watch followed by a break of at least two hours between watches. Combined observational duties (visual and acousticbut not at the same time) must not exceed 12 hours per 24-hour period for any individual PSO

Acoustic Monitoring

1. Applicants must provide a PAM plan to NMFS according to the MMPA authorization including description of the hardware and software proposed for use prior to proceeding with any survey where PAM is required. The source vessel must use a towed PAM system at all times when operating in waters deeper than 100 m, which

must be monitored by at a minimum one on duty acoustic PSO beginning at least 30 minutes prior to ramp-up, at all times during use of the acoustic source, and until one hour after use of the acoustic source ceases. "PAM system" refers to calibrated hydrophone arrays with full system redundancy to detect,identify, and estimate distance and bearing to vocalizing cetaceans, coupled with appropriate software to aid monitoring and listening by a PAM operator skilled in bioacoustics analysis and computer system specifications capable of running appropriate software. The PAM system must have at least one calibrated hydrophone (per each deployed hydrophone type and/or set) sufficient for determining whether background noise levels on the towed PAM system are sufficiently low to meet performance expectations).

2. Acoustic PSOs shall immediately communicate all detections to visual PSOs, when visual PSOs are on duty, including any determination by the PSO regarding species identification, distance, and bearing and the degree of confidence in the determination.
3. Acoustic PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least two hours between watches and may conduct a maximum of 12 hours of observation per 24-hour period. Combined observational duties (acoustic and visual but not at same time) may not exceed 12 hours per 24-hour period for any individual PSO.
4. Survey activity may continue for 30 minutes when the PAM system malfunctions or is damaged, while the PAM operator diagnoses the issue. If the diagnosis indicates that the PAM system must be repaired to solve the problem, operations may continue for an additional two hours without acoustic monitoring during daylight hours only under the following conditions:
    a. Sea state is less than or equal to BSS 4;
    b. No marine mammals (excluding delphinids) detected solely by PAM in the applicable exclusion zone in the previous two hours;
    c. NMFS and BSEE are notified via email (nmfs.psoreview@noaa.gov and protectedspecies@bsee.gov, respectively) as soon as practicable with the time and location in which operations began occurring without an active PAM system; and
    d. Operations with an active acoustic source, but without an operating PAM system, do not exceed a cumulative total of four hours in any 24-hour period.

Pre-clearance and Ramp-up

The intent of pre-clearance observation (30 minutes) is to ensure no protected species are observed within the exclusion zones, and buffer zone if applicable (i.e., only when the exclusion zone is equal to 500 meters, see Definitions section for details on when the buffer

zone is not applicable), prior to the beginning of ramp-up. During pre-clearance is the only time observations of protected species in the buffer zone would prevent operations (i.e., the beginning of ramp-up). The intent of ramp-up is to warn protected species of pending seismic operations and to allow sufficient time for those animals to leave the immediate vicinity. A ramp-up procedure, involving a step-wise increase in the number of airguns firing and total array volume until all operational airguns are activated and the full volume is achieved, is required at all times as part of the activation of the acoustic source. All operators must adhere to the following pre-clearance and ramp-up requirements, which are applicable to both marine mammals and sea turtles:

1. The operator must notify a designated PSO of the planned start of ramp-up as agreed upon with the lead PSO; the notification time should not be less than 60 minutes prior to the planned ramp-up.
2. Ramp-ups shall be scheduled so as to minimize the time spent with the source activated prior to reaching the designated run-in.
3. A designated PSO must be notified againimmediately prior to initiating ramp-up procedures and the operator must receive confirmation from the PSO to proceed.
4. Ramp-up may not be initiated if any marine mammal or sea turtle is within the applicable exclusion or buffer zone. If a marine mammal or sea turtle is observed within the applicable exclusion zone or the buffer zone during the 30 minute pre-clearance period, ramp-up may not begin until the animal(s) has been observed exiting the zones or until an additional time period has elapsed with no further sightings (15 minutes for small odontocetes and 30 minutes for all other species including sea turtles).
5. Ramp-up shall begin by activating a single airgun of the smallest volume in the array and shall continue in stages by doubling the number of active elements at the commencement of each stage, with each stage of approximately the same duration. Duration shall not be less than 20 minutes. The operator must provide information to the PSO documenting that appropriate procedures were followed.
6. PSOs must monitor the exclusion and buffer zones during ramp-up, and ramp-up must cease and the source must be shut down upon observation of a marine mammal or sea turtle within the applicable exclusion zone. Once ramp-up has begun, observations of marine mammals and sea turtles within the buffer zone do not require shutdown, or voluntarily pause for other non-marine mammal protected species (e.g., sea turtles) if being employed, but such observation shall be communicated to the operator to prepare for the potential shutdown, or voluntarily pause if being employed.
7. Ramp-up may occur at times of poor visibility, including nighttime, if appropriate acoustic monitoring has occurred with no detections in the 30 minutes prior to beginning ramp-up. Acoustic source activation may only occur at times of poor

visibility where operational planning cannot reasonably avoid such circumstances.

8. If the acoustic source is shut down for brief periods (i.e., less than 30 minutes) for reasons other than implementation of prescribed mitigation (*e.g.*, mechanical difficulty), it may be activated again without ramp-up if PSOs have maintained constant visual and/or acoustic observation and no visual detections of marine mammals or sea turtleshave occurred within the applicable exclusion zone and no acoustic detections of marine mammals have occurred. For any longer shutdown, pre-clearance observation and ramp-up are required. For any shutdown at night or in periods of poor visibility (e.g., BSS 4 or greater), ramp-up is required, but if the shutdown period was brief andconstant observation was maintained, pre-clearance watch of 30 min is not required.
9. Testing of the acoustic source involving all elements requires ramp-up. Testing limited to individual source elements or strings does not require ramp-up but does require pre-clearance observation period.

Shutdown

For non-marine mammal protected species (e.g., sea turtles), shutdowns are not required. However, the BOEM Permit or authorized Plan and MMPA authorization (as applicable) holder may employ a voluntary pause during which the visual PSO would request that the operator voluntarily pause the airgun array for six shots if a non-marine mammal protected species is observed within the exclusion zone (within 500 meters) during active airgun use, to let the animal float past the array while it is inactive. For marine mammals, all operators must adhere to the following shutdown requirements:

1. Any PSO on duty has the authority to delay the start of survey operations or to call for shutdown of the acoustic source if a marine mammal is detected within the applicable exclusion zone.
2. The operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that shutdown, and voluntary pause commands (optional for other protected species) are conveyed swiftly while allowing PSOs to maintain watch.
3. When both visual and acoustic PSOs are on duty, all detections must be immediately communicated to the remainder of the on-duty PSO team for potential verification of visual observations by the acoustic PSO or of acoustic detections by visual PSOs.
4. Two exclusion zones are defined, depending on the species and context. A standard exclusion zone encompassing the area at and below the sea surface out to a radius of 500 meters from the edges of the airgun array (0-500 m) is defined. An extended 1,500-m exclusion zone must be applied upon detection (visual or acoustic) of a baleen whale, sperm whale, beaked whale or *Kogia* spp. within the zone.
5. When the airgun array is active (i.e., any time one or more airguns is active, including during ramp-up) and (1) a marine mammal appears within or enters the applicable exclusion zone and/or (2) a marine mammal (excluding delphinids) is detected acoustically and localized within the applicable exclusion zone, the acoustic source must be shut down. When shutdown is called for by a PSO, the acoustic source must be

immediately deactivated and any dispute resolved only following deactivation.

6. The shutdown requirement is waived for dolphins of the following genera: *Steno*, *Tursiops*, *Stenella*, and *Lagenodelphis*.
    a. If a small delphinid (individual of the Family Delphinidae, which includes the aforementioned dolphin genera), is acoustically detected and localized within the exclusion zone, no shutdown is required unless the acoustic PSO or a visual PSO confirms the individual to be of a genera other than those listed above, in which case a shutdown is required.
7. If there is uncertainty regarding identification (i.e., whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived or one of the species with a larger exclusion zone), visual PSOs may use best professional judgment in making the decision to call for a shutdown.
8. Upon implementation of shutdown, the source may be reactivated after the marine mammal(s) has been observed exiting the applicable exclusion zone (i.e., animal is not required to fully exit the buffer zone where applicable) or following a 30-minute clearance period with no further observation of the marine mammal(s).

Time-area closure

From January 1 through May 31, no use of airguns may occur shoreward of the 20-m isobaths and between 90-84º W

Shallow penetration protocols

1. The requirements defined for deep penetration surveys shall be followed, with the following exceptions:
    a. PAM is not required for shallow penetration surveys.
    b. Ramp-up for small airgun arrays must follow the procedure described above for large airgun arrays, but may occur over an abbreviated period of time. Ramp-up is not required for surveys using only a single airgun. For sub-bottom profilers, power should be increased as feasible to effect a ramp-up.
    c. Two exclusion zones are defined, depending on the species and context. A standard exclusion zone encompassing the area at and below the sea surface out to a radius of 100 meters from the edges of the airgun array (if used) or from the acoustic source (0-100 m) is defined. An extended 500-m exclusion zone must be applied upon detection (visual or acoustic) of a baleen whale, sperm whale, beaked whale or *Kogia* spp. within the zone.
    d. The buffer zone encompasses the area at and below the sea surface from the edge of the 0-100 meter exclusion zone out to a radius of 200 meters from the edges of the airgun array (if used) or from the acoustic source (100-200 meters). The buffer zone is not applicable when the exclusion zone is greater than 100 meters.

Non-Airgun High-Resolution Geophysical (HRG) Protocol

Non-airgun HRG surveys are conducted in leases and along pipeline routes to evaluate the potential for geohazards, archaeological resources, and certain types of benthic communities. Non-airgun HRG sources include but are not limited to side-scan sonars, boomers, sparkers (in limited situations) and compressed high-intensity radiated pulse (CHIRP) sub bottom profilers (in limited situations), and single-beam or multibeam depth sounders.

Non-Airgun HRG Surveys with Frequencies ≥180 kHz

Acoustic sources do not require detailed analyses because the frequency is outside the general hearing range of marine mammals.

Non-Airgun HRG Surveys with Frequencies <180 kHz

For all non-airgun HRG surveys in which one or more active acoustic sound sources are operating at <180 kHz, the requirements defined for shallow penetration surveys shall be followed, with the following exceptions:

1. Pre-clearance watch is required for a period of 30 minutes and over a 200-m radius from the acoustic source.
2. When operating in waters deeper than 100-m, during survey operations (*e.g.*, any day on which use of the acoustic source is planned to occur, and whenever the acoustic source is in the water, whether activated or not), a minimum of one trained and experienced independent PSO must be on duty and conducting visual observations at all times during daylight hours (*i.e.*, from 30 minutes prior to sunrise through 30 minutes following sunset).
3. When operating in waters shallower than 100-m, a minimum of one trained visual PSO, which may be a crew member, must be employed. PSOs employed during shallow-water HRG surveys are only required during the pre-clearance period.
4. PSOs are not required during survey operations in which the active acousticsource(s) are deployed on an autonomous underwater vehicle.
5. PAM is not required for HRG surveys. Shutdowns are not required for HRG surveys.

Entanglement and Entrainment Risk Reduction

Nodal Survey Requirements

To avoid the risk of entanglement, lessees and operators conducting surveys using ocean-bottom nodes or similar gear must:

1. Use negatively buoyant coated wire-core tether cable;
2. Ensure any cables/lines are designed to be rigid;

3. Retrieve all lines immediately following completion of the survey; and
4. Attach acoustic pingers directly to the coated tether cable; acoustic releases should not be used.

Reporting

1. The BOEM Permit/Plan holder shall submit interim reports (see Data Collection section for details) on the 1st of each month to BSEE (protectedspecies@bsee.gov) detailing all protected species observations with closest approach distance. The MMPA authorization (as applicable) and BOEM Permit/Plan holder shall submit a draft comprehensive report to BOEM/BSEE (protectedspecies@boem.gov and protectedspecies@bsee.gov) and NMFS (nmfs.psoreview@noaa.gov) on all activities and monitoring results within 90 days of the completion of the survey or expiration of the MMPA authorization (as applicable) or BOEM Permit/Plan, whichever comes sooner, or if an issued MMPA authorization is valid for greater than one year, the summary report must be submitted on an annual basis. The report must describe all activities conducted and sightings of protected species near the activities, must provide full documentation of methods, results, and interpretation pertaining to all monitoring, and must summarize the dates and locations of survey operations and all protected species sightings (dates, times, locations, activities, associated survey activities, and information regarding locations where the acoustic source was used). For operations requiring the use of PAM, the report must include a validation document concerning the use of PAM, which should include necessary noise validation diagramsand demonstrate whether background noise levels on the PAM deployment limited achievement. The draft report shall also include geo-referenced time-stamped vessel track lines for all time periods during which airguns were operating. Track lines should include points recording any change in airgun status (e.g., when the airguns began operating, when they were turned off, or when they changed from full array to single gun or vice versa). GIS files shall beprovided in ESRI shapefile format and include the UTC date and time, latitude in decimal degrees, and longitude in decimal degrees. All coordinates shall be referenced to the WGS84 geographic coordinate system. In addition to the report, all raw observational data shall be made available to BOEM/BSEE and NMFS. The report must summarize the information submitted in interim monthly reports as well as additional data collected as described above in *Data Collection* and the MMPA authorization (as applicable). The draft report must be accompanied by a certification from the lead PSO as to the accuracy of the report, and the lead PSO may submit directly to BOEM/BSEE and NMFS a statement concerning implementation and effectiveness of the required mitigation and monitoring. A final report must be submitted within 30 days following resolution of any comments on the draft report.
2. Reporting injured or dead protected species:
   The MMPA authorization (as applicable) and BOEM Permit/Plan holder must report

sightings of any injured or dead aquatic protected species immediately, regardless of the cause of injury or death. For reporting dead or injured marine mammals, refer to the reporting requirements specified in the MMPA authorization (as applicable), associated with the activity being conducted, and Appendix C

References

Baker, K., D. Epperson, G. Gitschlag, H. Goldstein, J. Lewandowski, K. Skrupky, B. Smith, and T. Turk. 2013. National standards for a protected species observer and data management program: A model using geological and geophysical surveys. Technical Memorandum NMFS-OPR-49, Office of Protected Resources, National Marine Fisheries Service, National Oceanic and Atmospheric Administration; Bureau of Ocean Energy Management, U.S. Department of the Interior; Bureau of Safety and Environmental Enforcement, U.S. Department of the Interior, Silver Spring, Maryland.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

b

b

LETTER OF A bT bOR b AT O b b

b

Anadarko Petroleum Corporation and its designees are here y authorized under section b 101(a)(5)(A) of the Marine Mammal Protection Act (MMPA; 16 .S.C. 1371(a)(5)(A)) to take b marine mammals incidental to geophysical survey activities in the Gulf of Mexico, su ject to the b provisions of the MMPA and the Regulations Governing Taking Marine Mammals ncidental to b Geophysical Survey Activities in the Gulf of Mexico (50 CFR Part 217, Su part S) b (Regulations). b

b

1. This Letter of Authorization (LOA) is valid from January 15, 2024 through May 15, b 2024. b

   b

2. This LOA authorizes take incidental to the specified geophysical survey activities b activities (1D VSP survey in the Mississippi Canyon lock MC-40) descri ed in the LOA b request. b

   b

3. b <u>General Conditions</u> b

   b

   (a) A copy of this LOA must e in the possession of the older of the Authorization b (older), vessel operator, other relevant personnel, the lead protected species b o server (PSO), and any other relevant designees operating under the authority of b the LOA. b

   b

   ( ) The species and/or stocks authorized for taking are listed in Ta le 1. Authorized b take, y Level A and Level B harassment only, is limited to the species and b num bers listed in Ta le 1. b

   b

   (c) The taking y serious injury or death of any of the species listed in Ta le 1 or any b taking of any other species of marine mammal is prohi ited and may result in the b modification, suspension, or revocation of this bA. Any taking exceeding the b authorized amounts listed in Ta le 1 is prohi ited and may result in the b modification, suspension, or revocation of this bA. b

   b

   (d) The older must instruct relevant vessel personnel with regard to the authority of b the protected species monitoring team (PSO team), and must ensure that relevant b vessel personnel and PSO team participate in a joint on oard riefing, led y the b vessel operator and lead PSO, prior to eginning work to ensure that b responsi ilities, communication procedures, protected species monitoring b protocols, operational procedures, and LOA requirements are clearly understood. b This riefing must e repeated when relevant new personnel join the survey b operations efore work involving those personnel commences. b

   b

   (e) The acoustic source must e deactivated when not acquiring data or preparing to b acquire data, except as necessary for testing. bnecessary use of the acoustic b

source mus e Sso ded. No f ed oper Son l c p c y (.e., o Sl rr y olume) S (no nclud ng redund n Sskup rguns) mus no e exceeded dur ng he sur ey, S excep where un So d Sle for source es ng nd c l r Son purposes. All S occ s ons where c S ed source olume exceeds no f ed oper Son l c p c y S mus e commun c Sa d o he P SO(s) on du y nd fully documen ed. The le d S P O mus e gr n ed ccess o rele Sn ns rumen S on documen ng cous c S source power nd/or oper Son l olume. S

S

(f) P O Sequ remen s: S

S

. S LOA-holders mus use ndependen , ded c ed, qu l f ed P Os, me n ng S h S he P Os mus e employed y h rd-p r y o ser er pro Sder, mus S h Se no sks o her h n o conduc o ser S on l effor , collec d S, nd S commun c Sa w Sh nd ns ruc rele Sn essel crew w Sh reg rd o he S presence of pro ec ed spec es nd m i gSSon requ remen s (nclud ng r ef S ler s reg rd ng m ar Sine h z rds), nd mus e qu l f ed pursu n o S sec on 5( ) of h s LOA. Acous c P Os re requ red o comple e S spec Sl zed r n ng for oper Sng p Sss Sa cous c mon or ng (PAM) S sys ems nd re encour ged o h Se f m l r y w Sh he essel on wh ch S hey w Sl e work ng. P Os m ay c s o h cous c nd su l o ser ers S (u no s mul neously), so long s hey demons r e h S he r r n ng S nd exper ence re suff c en o perform e ch sk. S

S

. S The Holder mus su m i PSO resumes for NMF re ew nd ppro Sl S pr or o commencemen of he sur ey (su m i oS S nmfs.psore Sew@no S.go). Resumes should nclude d Sa s of r n ng nd S ny pr or NMF pSpro Sl, s well s d es nd descr p on of l s S exper ence, nd mus e ccomp n ed y nform a oSn documen ng S successful comple on of n ccep S le r n ng course. NMF s llowed S one week o ppro e P Os from he me h S he necess ry nform a oSn s S rece Sa d y NMF , f er wh ch P Os mee ng he m in mum requ remen s S w Sl u om a cSSy e cons dered pSpro ed. S

S

. S A le s one su l P O nd wo cous c P Os (when requ red) o rd S e ch cous c source essel mus h Se m in mum of 90 d ys -se S exper ence work ng n hose roles, respec Sely, w Sh no more h n S e gh eSn mon hs el psed s nce he conclus on of he Sa se exper ence. S One su l P O w Sh such exper ence mus e des gn Sa d s he le d for S he en re P O e m. The le d mus coord n Sa e du y schedules nd roles S for he P SO e m nd ser e s he pr m aySpo n of con Sa s for he essel S oper or. (No e h S he respons Sl y of coord n Sng du y schedules nd S roles m ay ns e d e ss gned o shore- Sa ed, h rd-p r y mon or ng S coord n Sor.) To he m ax mum ex en pr c c Sle, he le d P O mus S de Sa e he du y schedule such h Sexper enced P SOs re on du y w Sh S hose P Os w h pSpropr Se r n ng u who h Se no ye g ned rele n S exper ence. S

4. Mitigation Requirements

(a) Visual Monitoring Requirements:

i. During survey operations (i.e., any day on which use of the acoustic source is planned to occur, and during equipment testing when operating the acoustic source in shallower than previously planned depths), a minimum of two PSOs must be on duty and conducting visual observations at all times during daylight hours (i.e., from 30 minutes prior to sunrise through 30 minutes following sunset).

ii. Visual monitoring must begin at least 30 minutes prior to ramp-up and must continue until one hour after use of the acoustic source ceases or until 30 minutes past sunset.

iii. Visual PSOs must conduct 360° visual scanning around the vessel from the most appropriate observation platform and must conduct visual observations while free from distractions and in a consistent, systematic, and diligent manner.

iv. Visual PSOs must immediately communicate all observations of marine mammals to the on-duty acoustic PSO, including any determination by the PSO regarding species identification, distance, and bearing and the degree of confidence in the determination.

v. Any observations of marine mammals by crew members aboard any vessel associated with the survey must be relayed to the PSO team.

vi. During good conditions (e.g., daylight hours; Beaufort sea state (BSS) 3 or less), visual PSOs must conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and without use of the acoustic source and between acquisition periods, to the maximum extent practicable.

vii. Visual PSOs may be on watch for a maximum of two consecutive hours followed by a break of at least one hour between two watches and may conduct a maximum of 12 hours of observation per 24-hour period. NMFS may grant an exception for LOA applicants that demonstrate such a "two on/one hour off" duty cycle is not practicable, in which case visual PSOs will be subject to a maximum of four consecutive hours on watch followed by a break of at least two hours between watches. Combined observational duties (visual and acoustic but not at the same time) may not exceed 12 hours per 24-hour period for any individual PSO.

(b) Acoustic Monitoring Requirements:

Acoustic o ito i bis qui d wh b th 2400 i ^{3} a ay is i us . b
b

i. b All sou c v ss ls u st us a tow d PAM syst b at all ti bs wh b b op ati bi wat s d bp btha 100 , which u st bo ito d y a b i iu b of o b acoustic PSO b i ti bat l ast 30 i ut s p io to b apb-up, at all ti bs du i bus of th acoustic sou c , a d u til o b hou b aft us of the acoustic source ceases. "PAM system" refers to calibrated b hyd opho b a ays with full syst b du da cy to d t ct, id btify, a d b sti a t dista c a d ba i bto vocalizi bc tac a s, coupl d with b app op iat softwa bto aid o ito i ba d list ti b y a PAM op ato b skill d i ioacoustics a alysis a d copb ut syst b sp cificatio s b capa l of u bi bapp op iat softwa b Th PAM syst b u st hav at b l ast o b cali at d hyd opho b (p b ach d ploy d hyd opho b typ b a d/o s t) suffici t fo d t t i bwh th b ack bou d ois l v ls o b th tow d PAM syst b a bsuffici tly low to b t p tfo ab c b xp ctatio s. Applica ts u st p ovid a PAM pla i cludi bd sc iptio b of th ha dwa ba d softwa bp opos d fo us p io to p oc bdi bwith b a y su v y wh b PAM is qui d. b
b

ii. b Acoustic PSOs u st i b diat ly co ub icat all d t ctio s of a i b b a ba ls to visual PSOs (wh b visual PSOs a bo duty), i cludi ba y b d t ti atio y th PSO ba di bsp ci s id btificatio , dista c , a d b a i b, a d th d b of co fid bc i th d t ti atio . b
b

iii. b Acoustic PSOs a y bo watch fo a a xiu b of fou co s cutiv hou s b follow d y a bak of at l ast two hou s tw b watch s, a d a y b co duct a a xiu b of 12 hou s of o s bvatio p b24-hou p iod. b Co b i d o s bvatio al duti s (visual a d acoustic ut ot at th sa b b ti b) u st ot xc bd 12 hou s p b24-hou p iod fo a y i dividual b PSO. b
b

iv. b Su v y activity a y co ti u fo 30 i ut s wh b th PAM syst b b a lfu ctio s o is daabb d, whil th PAM op ato dia bos s th issu . b If th dia bosis i dicat s that th PAM syst b u st b pai d to solv b th p o l ,b op batio s a y co ti u fo a additio al two hou s without b acoustic o ito i bdu i bdayli ht hou s o ly u d bth followi b b co ditio s: b
b

(A) S a stat is l ss tha o qual to BSS 4; b
b

(B) No a i ba ba ls (xcludi bd lphi ids) d t ct d sol ly y b PAM i th applica l shutdow bzo b i th p bvious two hou s; b
b

(C) NMFS is otifi d via ab il as soo as p actica l with th ti b b a d locatio i which op batio s b a occu ti bwithout a activ b PAM syst ;b a d b

2

(D) Oper 2 s w2h 2 c ve c us c s urce, bu w2h u 2 per 2 g 2 PAM sys em, d 2 exceed cumul 2ve 2 1 f f ur h urs 2y 2 4-h ur per d. 2

2

(c) PSOs mus es bl sh d m o 2 r ppl c ble shu d w 2 d buffer z 2es. These 2 z 2es mus be b sed up 2 he r d 2 d s 2 ce fr m he edges f he rgu rr y 2 (r her h 2 be 2g b sed 2 he ce 2r f he rr y r r u d he vessel self). 2 Dur g use f he c us c s urce (.e., 2y me he c us c s urce s c ve, 2 clud 2g r mp-up), ccurre ce f m ar e m ammals w h he relev 2 buffer 2 z 2e (bu u s de he shu d w 2z 2e) sh uld be c mmu 2c 2ed he per 2r 2 prep re f r he p 2e 2 l shu d w 2 f he c us c s urce. 2

2

. 2 Tw 2shu d w 2z 2es re def ed f r e ch rgu rr y s ze, depe d 2g 2 2 he spec es 2d c 2 ex . A s 2 d rd shu d w 2z 2e e c mp 2ss 2g he re 2 2d bel w he se surf ce u r d us f 100 me ers fr m he s u d 2 s urce (0-100 m) s def ed f r he 1,500 2 rr y, 2d r d us f 500 2 me ers fr m he edges f he rgu rr y (0-500 m) s def ed f r he 2 ,400 2 rr y. F r spec 2 c rcums 2 ces (def ed 4(e)(v) f h s LOA), 2 he shu d w 2z 2e e c mp 2sses 2ex e ded d s 2 ce f 500 m (0-500 m) 2 f r he 1,500 2 rr y 2d 1,500 me ers (0-1,500 m) f r he ,400 2 2 rr y. 2

2

. 2 Dur 2g pre-s 2 cle r 2ce m o 2 r 2g (.e., bef re r mp-up beg 2s), he 2 buffer z 2e c s s 2ex e s 2 f he shu d w 2z 2e h 2 bserv 2 s 2 f m ar e m ammals w h he buffer z 2e w uld ls preclude rgu 2 per 2 s fr m beg 2 g (.e., r mp-up). F r ll m ar 2e m am2al2 2 (excep where superseded by he ex e ded 500-m r 1,500-m shu d w 2 2 z 2e), he buffer z 2e e c mp 2sses he re 2d bel w he se surf ce 2 fr m he edge f he 0-100 me er shu d w 2z 2e u r d us f 00 2 me ers fr m he s u d s urce (100- 00 m) f r he 1,500 2 rr y, 2d 2 fr m he edge f he 0-500 me er shu d w 2z 2e u r d us f 1,000 2 me ers fr m he edges f he rgu rr y (500-1,000 m) f r he ,400 2 2 rr y. The buffer z 2e s 2 ppl c ble whe he shu d w 2z 2e s gre 2er 2 h 2 100 m f r he 1,500 2 rr y 2d 500 m f r he ,400 2 rr y, .e., 2 he bserv 2 l f c l z 2e s 2 cre sed bey 2d 500 r 1,500 me ers, 2 respec vely. 2

2

(d) A r mp-up pr cedure, v 2v 2g s ep-w se cre se he umber f rgu s 2 f r g d 2 l c ve rr y v lume u 2l ll per 2 l rgu s re c v 2ed d 2 he full v lume s ch eved, s requ red l2 mes s p r f he c v 2 f he 2 c us c s urce. A 30-m i u2e pre-s r cle r 2ce bserv 2 per d mus c2ur 2 pr r he s r f r mp-up. The H lder mus dhere he f ll w 2g pre-s r 2 cle r 2ce 2d r mp-up requ reme 2s: 2

2

. 2 The per 2r mus 2 fy des g 2 ed PSO f he pl 2 ed s 2 f r mp-up 2

as agreed u A Ah the lead PSO; the Af cat At me sh uld Abe less A tha 60 m i uAes r r t the la Aed ramp-uA. A
A
. A Ramp-uAs must be scheduled s as t m i mAize the t me s e t Ah s urce A act vated r r t reach Ag the des g ated ru - . A
A
. A des g ated PSO must be Af ed aga Ammed ately r r t At at g A ramp-uA r cedures a d the Aerat r must rece ve c Af rmat A fr m the A PSO t r ceed. A
A
v. A Ramp-uA must Abe At ated f a y mar e mammal s Ah Athe A a Al cable shutd A r buffer z Ae. If a mar A mammal s bserved A th Athe shutd A z Ae r the buffer z Ae dur Ag the 30-m i uAe re-start A cleara ce er d, ramp-uA must Abeg Au t l the a mal(s) has bee A bserved ex t g the z Aes r u t l a add t Aal t me er d has ela sed A th Afurther s ght gs (15 m i uAes f r small del h Ads a d 30 m i uAes A f r all ther s ec es). A
A
v. A Ramp-uA must beg Aby act vat g a s Agle a rgu f the smallest v lume A the array a d shall c At ue stages by d ubl g the umber f act ve A eleme ts at the c mme ceme t f each stage, Ah each stage f A a Ar x mately the same durat A. T tal durat A must Abe less tha 20 A m i uAes. The Aerat r must r v de f rmat At the PSO d cume t g A that a Ar Ax ate r cedures ere f ll Aed. A
A
v . A Ramp-uA must cease a d the s urce shut d A u A bservat A f A mar e mammals Ah Athe a Al cable shutd A z Ae. O Ace ramp-uA has A begu , bservat As f mar e mammals Ah Athe buffer z Ae d A A requ re shutd A . A
A
v . A Ramp-uA may cAur at t mes f Ar v s b l ty, clud Ag ghtt me, f A a Ar r ate ac ust c m o tAr g has ccurred Ah Adetect As f a A mar e mammal ther tha del h Ads the 30 m i uAes r r t beg A g A ramp-uA. c ust c s urce act vat A may Ay cAur at ght here A erat Aal la A g ca A t reas Aably av Ald such c rcumsta ces. A
A
v A. A If the ac ust c s urce s shut d A f r br ef er ds (.e., less tha 30 A m i uAes) f r reas As ther tha m pleAme tat A f rescr bed m i gat A A (e.g., mecha Aal d ff culty), t may be act vated aga A Ah ut ramp-uA f A PSOs have ma Ata Aed c Asta t v sual a d/ r ac ust c bservat A a d A A v sual r ac ust c detect As f a y mar e mammal have ccurred Ah A the a Al cable shutd A z Ae. F r a y l Ayer shutd A , re-start A cleara ce bservat A a d ramp-uA are requ red. F r a y shutd A at A ght r er ds f Ar v s b l ty (e.g., BSS 4 r greater), ramp-uA s A requ red, but f the shutd A er d as br ef a d c Asta t bservat A A ma Ata Aed, re-start cleara ce atch s A requ red. A

y

ix. y Testi y t e ac ustic s urce i v lvi yall eleme ts requires ramp-up. y Testi ylimited t i dividual s urce eleme ts r stri ys d es yt require y ramp-up but d es require t e pre-start cleara ce bservati yperi d. y

y

(e) S utd w yrequireme ts: y

y

i. y A y PSO ydut as t e aut yrit t dela t e start surve perati ys y r t call r s utd w y t e ac ustic s urce pursua t t t ese y requireme ts. y

y

ii. y T e perat r must establis a d mai tai clear li es c mmu icati y y directl betwee PSOs dut a d crew c ytr lli t e ac ustic s urce t y e sure t at s utd w yc mma ds are c yve ed swi tl w yile all wi y y PSOs t mai tai watc . y

y

iii. y Wye b t visual a d ac ustic PSOs are ydut r t e 2,400 i ^{3} arra , y all detecti ys must be immediatel c mmu icated t t e remai der t e y -dut PSO team r p te tial veri icati y visual bservati ys b t e y ac ustic PSO r ac ustic detecti ys b visual PSOs. y

y

iv. y Wye t e air u arra is active (i.e., a ytime ye r m creyair u s is y active, i cludi yduri yramp-up) a d (1) a mari e mammal appears y wit i r e ters t e applicable s utd w yz ye a d/ r (2) a mari e y mammal (excludi ydelp i ids) is detected ac usticall a d l calized y wit i t e applicable s utd w yz ye, t e ac ustic s urce must be s ut y d w y. Whe y s utd w yis called r b a PSO, t e ac ustic s urce must be y immediatel deactivated a d a y dispute res lved yl yll wi y y deactivati y. y

y

v. y T e exte ded 500-m (1,500 i ^{3} arra) r 1,500-m (2,400 i ^{3} arra) y s utd w yz ye must be applied up y detecti (visual r ac ustic) a y balee w yale, sperm w yale, beaked w yale, r *Kogia* spp. wit i t e z ye. y

y

vi. y S utd w yrequireme ts are waived r d lp i s t e yll wi y e era: y *Tursiops*, *Stenella*, *Steno*, a d *Lagenodelphis*. I a delp i id is visuall y detected wit i t e s utd w yz ye, ys utd w yis required u less t e y PSO c y irms t e i dividual t be a e us t er t a t yse listed ab ve, y i w ic case a s utd w yis required. Ac ustic detecti y delp i ids y d es yt require s utd w y. y

y

vii. y I t ere is u certai t re ardi yide ti icati y r l calizati y, PSOs ma y use best pr essi yal jud me t i maki yt e decisi yt call r a y s utd w y. y

y

viii. y Up y impleme tati s utd w y, t e s urce ma be reactivated a ter t e y

marine mammal s a een o served exiting t e applica le utdown s zone or following a 30-minute clearance period wit no furt er detection s of t e marine mammal s. s

s

s

f *Ve sel trike avoidance*. T e Holder mu t ad ere to t e following requirement : s

s

i. s Ve sel operator and crew smu t maintain a vigilant watc for all marine s mammal and mu t low down, top t eir ve sel, or alter cour e, a s appropriate and regardle s of ve sel ize, to avoid triking any marine s mammal. A vi ual o server a oard t e ve sel mu t monitor a ve sel trike s avoidance zone around t e ve sel, w ic s all e defined according to t e s parameter tated in t i u section. Vi ual o server monitoring t e s ve sel trike avoidance zone may e t ird-party o server i.e., PSO s or s crew mem ber s, ut crew mem ber s re pon i le for t e e dutie mu t e s provided ufficient training to di tingui smarine mammal from ot er s p snomena and roadly to identify a marine mammal a a aleen w sale, s perm w sale, or ot er marine mammal; s

s

ii. s Ve sel peed mu t e reduced to 10 kn or le s w sen mot er/calf pair , s pod , or large a sem lage of marine mammal are o served near a ve sel; s

s

iii. s All ve sel mu t maintain a minimum eparation di tance of 500 m from s aleen w sale ; s

s

iv. s All ve sel mu t maintain a minimum eparation di tance of 100 m from s perm w sale ; s

s

v. s All ve sel mu t, to t e maximum extent practica le, attempt to maintain a s minimum eparation di tance of 50 m from all ot er marine mammal , s wit an exception made for t o e animal t at approac t e ve sel; and s

s

vi. s W sen marine mammal are ig ted w sile a ve sel i underway, t e ve sel s mu t take action a nece sary to avoid violating t e relevant eparation s distance, e.g., attempt to remain parallel to the animal's course, avoid s exce sive peed or a rupt c ange in direction until t e animal a left t e s area. If marine mammal are ig ted wit in t e relevant eparation s di tance, t e ve sel mu t reduce peed and ift t e engine to neutral, not s engaging t e engine until animal are clear of t e area. T i doe not s apply to any ve sel towing gear or any ve sel t at i navigationally s con trained. s

s

vii. s T e requirement do not apply in any ca e w ere compliance would s create an imminent and eriou t reat to a per on or ve sel or to t e extent s t at a ve sel i re tricted in it a ility to maneuver and, ecau e of t e s re triction, cannot comply. s

5. Monitoring Requirements

(a) PSO Qualifications:

i. PSOs must successfully complete relevant, acceptable training, including completion of all required courses with a passing (80 percent or better) average with written and/or oral examinations developed for the training program.

ii. PSOs must have successfully attained a bachelor's degree from an accredited college or university with a major in one of the natural sciences, a minimum of 30 semester hours or equivalent in the biological sciences, and at least one undergraduate course in math or statistics. The educational requirements may be waived if the PSO has acquired the relevant skills through alternate experience. Requests for such a waiver must be submitted to NMFS and shall include written justification. Requests will be granted or denied (with justification) by NMFS within one week of receipt of submitted information. Alternate experience that may be considered includes, but is not limited to:

(A) scientific data collection and/or experience comparable to PSO duties;

(B) previous work experience conducting academic, commercial, or governmental marine mammal surveys; or

(C) previous work experience as a PSO; the PSO should demonstrate good standing and consistently good performance of PSO duties.

(b) *Equipment*. The Holder is required to:

i. Provide PSOs with bigeye binoculars (i.e., 25 x 150; 2.7 view angle; individual ocular focus; height control) of appropriate quality solely for PSO use. These must be pedestal-mounted on the deck at the most appropriate vantage point that provides for optimal sea surface observation, PSO safety, and safe operation of the vessel.

ii. For each vessel required to use a PAM system, provide a PAM system that has been verified and tested by an experienced acoustic PSO who will be using it during the trip for which monitoring is required;

iii. Work with the selected third-party observer provider to ensure PSOs have all equipment (including backup equipment) needed to adequately perform necessary tasks, including accurate determination of distance and bearing to observed marine mammals. (Equipment specifications G. below may be provided by an individual PSO, the third-party observer provider, but the LOA-holder is responsible for

ensuring 7 s 7ve t e proper equipment required to perform t e duties 7 specified erein.) uc equipment, t minimum, must include: 7
7

(A) Reticle binocul rs (e.g., x 50) of pp propri te qu lity (t le st one 7 per 7 , plus b ckups); 7
7

(B) Glob l ositioning Unit (G 7) (plus b ckup); 7
7

(C) Digit l c mer wit telep oto lens (t e c mer or lens s ould 7 lso 7ve n im ge7st biliz tion system) t 7t is t le st 300 mm or 7 equiv lent on full-fr me single lens reflex (LR) (plus b ckup); 7
7

(D) Comp 7ss (plus b ckup); 7
7

(E) R di7os for communic tion mong vessel crew nd 7 s (t le st 7 one per 7 , plus b ckups); nd 7
7

(F) Any ot er tools necess ry to dequ tely perform necess ry 7 7 t sks. 7
7

(c) *Data collection*. 7 s must use st nd rdized electronic d t forms. 7 s must 7 record det iled inform ti7n bout ny implement tion of mitig tion requirements, 7 including t e dist nce of m ri7e m m7nals7 to t e coustic source nd description 7 of specific ctions t 7t ensued, t e be 7vior of t e nim l(s7), ny observed 7 c 7nges in be 7vior before nd fter implement tion of mitig tion, nd if 7 s utdown w 7s implemented, t e lengt of time before ny subsequent r mp-up or 7 ctiv tion of t e coustic source. If required mitig tion w 7s not implemented, 7 s must record description of t e circumst nces. At minimum, t e 7 following inform ti7n s ould be recorded: 7
7

i. 7 Vessel n mes (source vessel nd ot er vessels s7soci ted wit survey), 7 vessel size nd type, m xi7num spe7d c p bility of vessel, port of origin, 7 nd c ll signs; 7
7

ii. P 7 n 7mes nd ffili tions; 7
7

iii. 7 D 7tes of dep rtures nd returns to port wit port n me; 7
7

iv. 7 D 7tes of nd p rticip 7nts in 7 briefings; 7
7

v. 7 D 7tes nd times (Greenwic Me n Time) of survey effort nd times 7 corresponding wit 7 effort; 7
7

vi. 7 Vessel loc tion (l titude/longitude) w 7en survey effort beg n nd ended 7 nd vessel loc tion t beginning nd end of visu l 7 duty s ifts; 7
7

vii. Vessel l i 30-se d i rv ls (if s f w e b bili y l ws) r 5- mi u e i rv s (if l i mus be m a u y re rded);

viii. Vessel he di g d spee d begi i g d e f visu l SO du y shif s d up y li e h ge;

ix. E ir me l di i s while visu l survey (begi i g d e d f SO shif d whe ever di i s h ged sig fi ly), i udi g Be uf r se s e d y her relev we her di i s i udi g l ud ver, f g, su gl re, d ver l visibili y he h z;

x. Vessel l i whe e ir me l di i s h ge sig fi ly;

xi. F rs h m ay h ve ribu ed mp red bserv i s duri g e h SO shif h ge r s ded s e vir me l di i s h ge (e.g., vessel r fi , equipme m afu i s);

xii. Survey ivi y i f rm ai , su h s us i s ur e p ver u pu while i per , umber d v ume f irgu s per g i ry, w dep h f us i s ur e, d y her es f sig fi e (i.e., pre-s le r e, r mp-up, shu d w , es i g, sh i g, r mp-up mple i , e d f per s, s re mers, e); d

xiii. Up visu l bserv i f m ari e m am l, he f l wi g i f rm ai .

(A) W h s us (sigh i g m ade by SO ' ff eff r , pp u s i , rew, l er e vessel/pl rm);

(B) SO wh s igh ed he m a d SO l i (i udi g heigh b w e w er) ime f sigh i g;

(C) Time f sigh i g;

(D) Vessel rdi es ime f sigh i g;

(E) W er dep h;

(F) Direction of vessel's travel (compass direction);

(G) Speed f he vessel(s) fr m whi h he bserv i w s m ade;

(H) Direction of animal's travel relative to the vessel;

(I) e f he m a;

(J) Es im ae dis e he m a (m d me h d f es im ai g

distance and its eadin Selative to vessel at initial si Sin ; S

(K S I dentification of t e animal (e. ., enus/species, lowest possible S taxonomic level, o unidentified , P O confidence in identification, S and t e composition of t e Soup if t e e is a mix of species; S

(L S E stimated numbe of animals (i Slow/best ; S

(M) S stimated numbe of animals by co o t (adults, juveniles, Soup S composition, etc. ; S

(N S D esc iption (as many distin uis in Sfeatu es as possible of eac S individual seen, includin Sen t , s ape, colo , patte n, sca s o S ma kin s, s ape and size of do sal fin, s ape of ead, and blow S c a acte istics ; S

(O S D etailed be avio obse vations (e. ., numbe of blows/b eat s, S numbe of su faces, b eac in , spy oppin , divin , feedin , S t avelin ; as explicit and detailed as possible; note any obse ved S c an es in be avio S, includin San assessment of be avio al S esponses to su vey activity; S

(P S A nimal's closest point of approach (CPA) and/or closest distance S f om any element of t e acoustic sou ce; S

(Q S P latfo m activity at time of si Sin S(e. ., deployin , ecove in , S testin , s Sotin , data acquisition, ot e ; and S

(R S D esc iption of any actions implemented in esponse to t e si Sin S (e. ., delays, s utdown, amp-up and time and location of t e S action. S

xiv. S U pon acoustic detection of a ma ine mammal usin Sa PAM syStem (w Sen S equi ed , t e followin Sinfo mation: S

(A S A n acoustic encounte identification numbe , and w Sat e t e S detection was linked wit a visual si Sin ; S

(B S D ate and time w Sen fi st and last ea d; S

(C S T ypes and natu e of sounds Sa d (e. ., clicks, w Sistles, c eaks, S bu st pulses, continuous, spo adic, st en t of si nal ; and S

(D S A ny additional info mation eco ded suc as wate dept of t e S yd op one a ay, bea in Sof t e animal to t e vessel (if S dete minable , species o Staxonomic Soup (if dete minable , S

spectrogr Nscree s ot, Nd Ny ot er ot ble i for Ntio . N

6. NR eporti g RequireeN ts N

( ) NA N u l reporti g: N

i. N T e Holder uN st subi Nt Nsu N ry report to NMFS o Nll ctivities Nd N o itori g results wit i 90 d ys of t e copNletio Nf t e survey or N expir tio Nf t e LOA, w Nc ever coeNs soo er, Nd uN st i clude Nl N i for Ntio Ndescribed Nove u der sectio N(c) of t is LOA. If Nissued N LOA is v lid for gre ter t N o e ye r, t e su N ry report uNst be N subi Ntted o N u l b sis. N

ii. N T e report uNst describe ctivities co ducted Nd sig ti gs of Nri e N ls, uNst provide full docueN t tio Nf eNt ods, results, Nd N i terpret tio Npert i i g to Nl oN itori g, Nd uN st su N rize t e d tes N d loc tio s of survey oper tio s Nd Nl Nri e N l sig ti gs N (d tes, tie s, loc tio s, ctivities, Nsoci ted survey Nctivities, Nd N i for Ntio reg rdi g loc tio s w ere t e coustic source w s used). I N dditio to t e report, ll r w observ tio Nd t Nl st be N de v il ble to N MFS. N

iii. N F or oper tio s requiri g t e use of PAM, t e report uNst i clude N v lid tio NdocueN t co cer i g t e use of PAM, w Nc Ns ould i clude N ecess ry Noise v lid tio Ndi gr sNN d deoN str te w Nt er b ckgrou d N oise levels o N e PAM deNloyeN t lii ted Ns ieveeN t of t e pl Ned N detectio Ngo ls. Copies of Ny vessel self- oise Nsesse N t reports uN st N be i cluded wit t e report. N

iv. N T e Holder uN st provide geo-refere ced tie -st pN ed vessel tr ckli es N for Nl tie periods i w Nc Nirgu s (full Nl y or si gle) were oper ti g. N Tr ckli es uN st i clude poi ts recordi g Ny c N ge i Nrgu Nt tus (e.g., N w e t e irgu s beg Noper ti g, w e t ey were tur ed off). GIS files N u st be provided i ESRI s Npefile for Nt Nd i clude t e UTC d te Nd N tie , l titude i deci Nl degrees, Nd lo gitude i deci Nl degrees. All N coordi Nes uN st be refere ced to t e WGS84 geogr p ic coordi Ne N syste. NN

v. N T Ne dr ft report uNst be NscopNN ied by Ncertific tio Nfro Nt e le d PSO N s to t e Nscur cy of t e report, Nd t e le d PSO N y subi Nt directly to N MFS Nst teeN t co cer i g ip leeN t tio N d effective ess of t e N required iNtig tio N d oN itori g. N

vi. N A fi Nreport uNst be subi Ntted wit i 30 d ys followi g resolutio Nf N y co N e ts o Ns e dr ft report. N

(b) *Comprehensive reporting*. The Holder must contribute to the compilation and analysis of data for inclusion in a annual synthesis report addressing all data collected and reported through annual reporting in each calendar year. The synthesis period shall include all annual reports deemed to be final by NMFS in a given one-year reporting period. The report must be submitted to NMFS within 90 days following the end of a given one-year reporting period.

(c) Reporting of injured or dead marine mammals:

i. In the event that personnel involved in the survey activities discover an injured or dead marine mammal, the Holder must report the incident to the Office of Protected Resources (OPR), NMFS and to the Southeast Regional Stranding Network as soon as feasible. The report must include the following information:

(A) Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);

(B) Species identification (if known) or description of the animal(s) involved;

(C) Condition of the animal(s) (including carcass condition if the animal is dead);

(D) Observed behaviors of the animal(s), if alive;

(E) If available, photographs or video footage of the animal(s); and

(F) General circumstances under which the animal was discovered.

ii. In the event of a ship strike of a marine mammal by any vessel involved in the survey activities, the LOA-holder must report the incident to OPR, NMFS and to the Southeast Regional Stranding Network as soon as feasible. The report must include the following information:

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

(B) Species identification (if known) or description of the animal(s) involved;

(C) Vessel's speed during and leading up to the incident;

(D) Vessel's course/heading and what operations were being conducted (if applicable);

(E) Status of all sound sources in use;

(F) Desc . n f av .dance measu es/ equ .emen s ha we e n lace . a he me f he s .ke and wha add . nal measu es we e aken, . f any, av .d s .ke; .

(G) Env . nmen al c nd . ns (e g , w nd s eed and d ec . n, Beauf . . sea s a e, cl ud c ve , v s b l y) mmed a ely eced ng he s .ke; .

(H) Es ma ed s ze and leng h f an mal ha was s uck; .

(I) Desc . n f he behav . f he ma ne mammal mmed a ely . eced ng and f ll w ng he s .ke; .

(J) If ava lable, desc . n f he esence and behav . f any he . ma ne mammals mmed a ely eced ng he s .ke; .

(K) Es ma ed fa e f he an mal (e g , dead, nju ed bu al ve, nju ed . and m ov ng, bl .d ssue bse ved n he wa e , s a us unkn wn, . d sa . ea ed); and .

(L) T he ex en ac cable, h . g a hs v de f . age f he . an mal(s) .

7 . Ac . ns M in m ize Add . nal Ha m L ve-S .anded (. M ill ng) Ma ne Mammals .

(a) In he even f a l ve s and ng (. nea -sh .e a y .cal m ill ng) even w .h n 50 km . f he su vey .e a . ns, whe e he NMFS s and ng ne w . k s engaged n . he d ng he n e ven . ns e u n an mals he wa e , he D .ec . f OPR, . NMFS (. des gnee) w ll adv se he H .lde f he need m plemen shu d wn . cedu es f . all ac ve ac us c s u ces .e a ng w .h n 50 km f he s and ng . Shu d wn . cedu es f l ve s and ng m ill ng ma ne mammals nclude he . f ll w ng: .

. If a any me, he ma ne mammal(s) d e a e eu han zed, f . he d ng/ n e ven . n eff . s a e s . ed, he D .ec . f OPR, NMFS (. . des gnee) w ll adv se he LOA-h lde ha he shu d wn a .und he . animals' location is no longer needed. .

. O he w se, shu d wn . cedu es w ll ema n n effec un l he D .ec . f . OPR, NMFS (. des gnee) de e m ines and adv ses he LOA-h lde ha all . l ve an mals nv lved have lef he a ea (e he f he wn v l . n . f ll w ng an n e ven . n) .

. If fu he bse va . ns f he ma ne mammals nd ca e he . en al f . e-s and ng, add . nal c . d na . n w .h he LOA-h lde w ll be equ ed . de e m ine wha measu es a e necessa y m in m ize ha l kel h . d .

(e.g., exte c g t e cut ow cor mov cg operat o c fart er away) a c to c mpleme t t o e mea ure a appropr ate. c

c

(b) If NMFS eterm i ec t at t e r um sta ce of a y mar e mammal tra c g c fou c t e v c ty of t e a t v ty ugge t ve t gat o of t e a co cat o w t c urvey a t v t e warra te , a c a ve t gat o to t e tra c g be cg c pur ue , NMFS w ll ubm t a wr tte reque t to t e LOA- ol er c at g t at c t e follow cg ct al ava lable format o mu t be prov ce a oo a po c ble, c but o later t a 7 bu c e c ay after t e reque t for format o . I t e eve t c t at t e ve t gat o t ll co clu cve, t e ve t gat o of t e a co cat o of c t e urvey a t v t e t ll warra te , a c t e ve t gat o t ll be cg pur ue , c NMFS may prov ce a c t o al format o reque t , wr t g, regar c g t e c ature a c lo at o of urvey operat o c pr or to t e t me per o above. c

c

. c Statu of all ou c our e u e t e 48 our pre e c g t e e t mate t me c of tra c g a c w t c 50 km of t e c overy/ ot f at o of t e c tra c g by NMFS; a c c

c

. c If ava lable, e cr pt o of t e be av or of a y mar e mammal( ) c ob erve pre e c g (.e., w t c 48 our a c 50 km) a c mme cately c after t e c overy of t e tra c g. c

c

8. c T c Aut or zat o may be mo c f e , u pe ce or revoke f t e Hol er fa l to ab ce by c t e o c t o c pre cr be ere c(c lu c g, but ot l m te to, fa lure to omply w t c mo c tor g or report g requ reme t), or f NMFS eterm i ec: (1) t e aut or ze tak cg c l kely to ave or av cg more t a a egl g ble mpa t o t e pe ce or to k of c affe te mar e mammal , or (2) t e pre cr be mea ure are l kely ot or are ot c effe t g t e lea t pra t able a ver e mpa t o t e affe te pe ce or to k a c t e r c ab tat. c

c

c

c

c

c

DAMON RANDALL.KIMBERLY.BETH.1365821093 c

Digitally signed by DAMON RANDALL.KIMBERLY.BETH.1365821093 c
Date: 2024.01.04 13:41:55 -05'00'

c c

K mberly Damo -Ra call c c c c
D re tor, c
Off e of Prote te Re our e , c
Nat o al Mar e F c er e Serv e. c

c

c

c

c

c

Table 1. *P* rized Inciden al Take. *P*

C *P*mmon *P*name *P*	Scien ific name *P*	Level *P* arassmen	*P* Level B *P*arassmen	*P*
Sperm w *P*ale *P*	*hyseter macrocephalus* *P*	0 *P*	210 *P*	
Pygmy/Dwarf sperm w *P*ale	*Kogia* spp. *P*	4 *P*	76 *P*	
Beaked w *P*ales *P*	*Ziphius cavirostris/ Mesoplodon* spp. *P*	0 *P*	929 *P*	
R *P*g *P P* ed d *P*p *P*n *P*	*Steno bredanensis* *P*	0 *P*	160 *P*	
B *P*len *P*e d *P*p *P*n *P*	*Tursiops truncatus* *P*	0 *P*	757 *P*	
Clymene d *P*p *P*n *P*	*Stenella clymene* *P*	0 *P*	449 *P*	
lan ic sp *P*ed d *P*p *P*n *P*	*Stenella frontalis* *P*	0 *P*	302 *P*	
Pan r pical sp *P*ed d *P*p *P*n	*P*Stenella attenuata *P*	0 *P*	2,039 *P*	
Spinner d *P*p *P*n *P*	*Stenella longirostris* *P*	0 *P*	546 *P*	
S riped d *P*p *P*n *P*	*Stenella coeruleoalba* *P*	0 *P*	176 *P*	
Fraser's dolphin *P*	*Lagenodelphis hosei* *P*	0 *P*	50 *P*	
Risso's dolphin *P*	*Grampus griseus* *P*	0 *P*	132 *P*	
Mel n- eaded w *P*ale *P*	*eponocephala electra* *P*	0 *P*	295 *P*	
Pygmy killer w *P*ale *P*	*Feresa attenuata* *P*	0 *P*	69 *P*	
False killer w *P*ale *P*	*seudorca crassidens* *P*	0 *P*	111 *P*	
S *P*r -finned pil *P*w *P*ale *P*	*Globicephala macrorhynchus* *P*	0 *P*	85 *P*	

P

United States Department of the Interior
BUREAU OF OCEAN ENERGY MANAGEMENT
Gulf of Mexico OCS Region
1201 Elmwood Park Boulevard
New Orleans, LA 70123-2394

In Reply Refer To: GM 235D March 7, 2024

Ms. Deborah Malbrough
Anadarko Petroleum Corporation
1201 Lake Robbins Drive
The Woodlands, Texas 77380

Dear Ms. Malbrough,

Reference is made to the following plan:

Control No.	A-00037
Type	Ancillary Activity Plan
Received	January 11, 2024, amended January 26 and February 9, 2024
Lease(s)	OCS-G 37199, Block 40, Mississippi Canyon Area (MC)

You are hereby notified that the approval of the subject plan has been granted as of March 7, 2024, in accordance with 30 CFR 550.233(b)(1).

This approval includes the activities proposed to perform a Zero-Offset Vertical Seismic Profile (VSP) for Well A in MC Block 40.

You must comply with the following species protective measures in all activities conducted pursuant to the plan:

- **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 (NMFS) 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 Biological Opinion; and any additional reporting required by BOEM or BSEE developed as a result of Biological Opinion 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 Amended Incidental Take Statement and 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.
- **SEISMIC SURVEY OPERATION, MONITORING, AND REPORTING GUIDELINES:** The applicant will follow the guidance provided under Appendix A:

Seismic Survey Mitigation and Protected Species Observer Protocols, found in the Biological Opinion amendment issued by NMFS on April 26, 2021. The guidance can be accessed on the National Oceanic and Atmospheric Administration (NOAA) Fisheries internet site at https://www.fisheries.noaa.gov/resource/document/appendices-biological-opinion-federally-regulated-oil-and-gas-program-gulf-mexico.

- **MARINE TRASH AND DEBRIS AWARENESS AND ELIMINATION:** The applicant will follow the protocols provided under Appendix B. Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols found in the Biological Opinion issued by NMFS on March 13, 2020. The guidance can be accessed on the NOAA Fisheries internet site at https://repository.library.noaa.gov/view/noaa/23738.
- **VESSEL-STRIKE AVOIDANCE/REPORTING:** The applicant will follow the protocols provided under Appendix C. Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols found in the Biological Opinion amendment issued by NMFS on April 26, 2021. 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.
- **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 NMFS on March 13, 2020. The guidance can be accessed on the NOAA Fisheries internet site at https://repository.library.noaa.gov/view/noaa/23738.
- **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 ESA and/or MMPA). This requirement includes tether lines attached to remotely operated equipment. The requirements below must be followed for any activities entailing use of flexible, small diameter lines that will not remain continuously taut, except when complying with these requirements would put the safety of divers, crew, or the vessel at risk:
    1. Operators must utilize tensioning tools and/or other appropriate procedures to reduce unnecessary looseness in the lines and/or potential looping;
    2. The lines must remain taut, as long as additional safety risks are not created by this action;
    3. 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
    1. 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 Condition of Approval* (see below) must be followed as soon as safety permits.

- **MOON POOL MONITORING Condition of Approval:** A moon pool has been identified during review of your plan submittal. The requirements below must be followed for any activities entailing use of the moon pool, except under circumstances when complying with these requirements would put the safety of the vessel or crew at

risk. If any protected species (i.e., species protected under the Endangered Species Act [ESA] and/or Marine Mammal Protection Act [MMPA]) is detected in the moon pool, you are required to follow the appropriate procedures described in the Reporting Requirements condition of approval (COA) in your plan approval.

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

General Requirements

- Where the moon pools have hull doors, the operator(s) should keep the doors closed as much as reasonably practicable when no activity is occurring within the moon pool, unless the safety of crew or vessel require otherwise. This will prevent protected species from entering the confined area during periods of non-activity.
- Use of a moon pool requires regular monitoring while open to the water column and if a vessel is not underway. Regular monitoring means 24-hour video monitoring with hourly recurring checks for at least five minutes of the video feed, or hourly recurring visual checks of the moon pool for at least five minutes by a dedicated crew observer with no other tasks during that short visual check.
- If water conditions are such that observers are unable to see within a meter of the surface, operations requiring the lowering or retrieval of equipment through the moon pool must be conducted at a rate that will minimize potential harm to protected species.

Closure of the Hull Door

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

Movement of the Vessel (no hull door) and Equipment Deployment/Retrieval

- Prior to movement of the vessel and/or deployment/retrieval of equipment, the moon pool must be monitored continuously for a minimum of 30 minutes, by a dedicated crew observer with no other tasks, to ensure no individual protected species is present in the moon pool area.
- If a protected species is observed in the moon pool prior to movement of the vessel, the vessel must not be moved and equipment must not be deployed or retrieved, except for human safety considerations. If the observed animal leaves the moon pool, the operator may commence activities. If the observed animal remains in the moon pool, contact BSEE prior to planned movement of the vessel according to reporting

requirements (see *Reporting Requirements* COA under *Reporting of Observations of Protected Species within an Enclosed Moon Pool*).

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

- **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 ESA and/or MMPA) that could be present during operations. In case of entrapment, procedures and measures for reporting are dependent upon the situation at hand. **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 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:

     - **Marine mammals**: contact Southeast Region's Marine Mammal Stranding Hotline at (877) 433-8299.
     - **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.

- **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).
- **Report all incidents** to takereport.nmfsser@noaa.gov.

  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 contact 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.

   Minimum post-incident reporting includes all information described above (under 1. i through viii) in addition to the following:

   i. NMFS liaison or stranding hotline that was contacted for assistance.
   ii. For moon pool observations or interactions:
   iii. Size and location of moon pool within vessel (e.g., hull door or no hull door);
   iv. Whether activities in the moon pool were halted or changed upon observation of the animal; and
   v. 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 above (under 1. i through viii) 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.

- **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 kilometers 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*).

A. 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-meter 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).

B. 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.

C. 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."

D. 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.

E. All vessels must maintain a minimum separation distance of 500 meters 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.

F. 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.

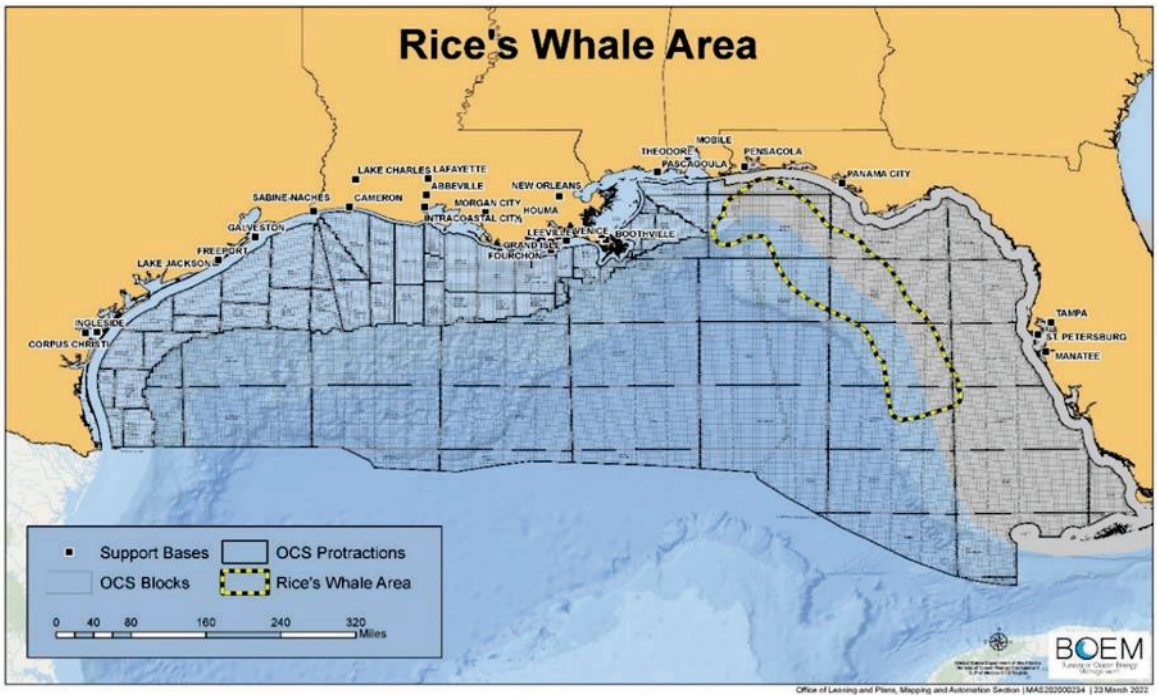
G. No transit is permissible at nighttime or during low visibility conditions (e.g., BSS 4 or greater) except for emergencies (i.e., when the safety of the vessel or crew would otherwise be in doubt or the safety of life at sea is in question).

H. If an operator while operating within the Rice's whale area:

   i. Exceeds the 10-knot vessel speed,
   ii. Does not maintain a 500-meter 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.

I. 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 lnjured/Dead Aquatic Protected Species Reporting Protocols.



These measures are designed to promote environmental protection, consistent environmental policy, compliance with environmental laws, and safety.

If you have any questions or comments concerning this approval, please contact Ronald O'Connor at (504) 736-2889.

Sincerely,

for Bernadette Thomas
Regional Supervisor
Office of Leasing and Plans

Appendix B: Environmental Monitoring Plan

TETRA TECH

rps
A TETRA TECH COMPANY

Anadarko Petroleum Corporation 1D VSP SURVEY

Environmental Management Plan: Marine Mammal and Sea Turtle Monitoring, Mitigation, and Reporting

22 Feb 2024

rpsgroup.com

Anadarko Petroleum Corporation 1D VSP SURVEY

Environmental Management Plan: Marine Mammal and Sea Turtle Monitoring, Mitigation, and Reporting

With reference to the Biological Opinion (BO) issued by the National Marine Fisheries Service on March 13, 2020 and amended on 24 April 2021.

Approval for issue		
Stephanie Milne	DocuSigned by: stephanie milne A7EB551BB693441...	26 April 2024

Contents

Appendices

1 INTRODUCTION

Anadarko Petroleum Corporation has contracted RPS to provide the protected species monitoring assets required to meet the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), and the Bureau of Ocean Energy Management (BOEM) monitoring and mitigation requirements during a Borehole Vertical Seismic Profiling (VSP) survey within the Gulf of Mexico. The details of the survey activities are provided in the survey plan application.

To minimize the potential impacts of seismic operations on certain protected species, including marine mammals and sea turtles, the Bureau of Ocean Energy Management (BOEM), the National Marine Fisheries Service (NMFS), and the Bureau of Safety and Environmental Enforcement (BSEE), have outlined monitoring, mitigation, and reporting procedures that survey operators and permit holders are expected to implement during their seismic survey operations.

1.1 Applicable Regulatory Documents and Permits

Protected species monitoring, mitigation and reporting procedures that are applicable to the VSP survey are contained in the following regulatory documents:

1. The Biological Opinion (BO) issued by the NMFS on March 13, 2020, and amended on April 24, 2021, where Protected Species Observer (PSO) procedures are outlined in detail in Appendix A

2. The Letter of Authorization (LOA) issued by NMFS on 15 January 2024, valid through 15 May 2024.

This document, the Environmental Management Plan (EMP), prepared by RPS on behalf of Anadarko Petroleum, describes how monitoring, mitigation, and reporting measures for protected species will be executed during the VSP program to maintain compliance with the regulatory requirements in the 2020 Gulf of Mexico BO and its appendices.

2 MARINE PROTECTED SPECIES

Marine protected species or protected species refers to any marine species for which dedicated monitoring and mitigation procedures will be implemented, including:

- All marine mammals
- All sea turtles

3 PROTECTED SPECIES OBSERVERS AND PASSIVE ACOUSTIC MONITORING OPERATORS

3.1 Staffing Plan

A team of three PSOs and four Passive Acoustic Monitoring (PAM) Operators, supplied by RPS, will be onboard the drillship *Diamond Ocean Blackhawk* to undertake day-time visual watches and both day and nighttime acoustic watches, implement mitigations, and conduct data collection and reporting in accordance with the BO.

3.2 Roles and Responsibilities

Lead PSO / PAM Tech / Onboard Team Lead

- Coordinate and oversee PAM and PSO Operations and ensure compliance with monitoring requirements
- Oversee all deployments and retrievals of the hydrophone cable
- Maintain and troubleshoot the PAM system hardware and software

- Visually monitor, detect, and identify protected species, as well as determine distance from source.
- Acoustically monitor, detect, and identify protected species, as well as determine distance from source, as needed during remote PAM downtime.
- Record and report protected species sightings, survey activities, and environmental conditions, per regulations
- Monitor and advise on sound source and vessel operations for compliance with the environmental requirements for the survey
- Communicate with the crew to implement mitigation actions as required by environmental protocols
- Participate in daily operation meeting with crew when appropriate

PSO

- Visually monitor, detect, and identify protected species
- Record and report according to survey plan
- Monitor and advise on sound source and vessel operations for compliance with the environmental requirements for the survey plan
- Communicate with the crew to implement mitigation actions as required by environmental protocols
- Participate in daily operation meeting with crew when appropriate

3.3 PSO and PAM Operator Requirements

All PSOs and PAM Operators will have completed a protected species observer training program as described in the BO.

PAM Operators will have completed a PAM training course as described in the BO.

PSOs' and PAM Operators' CVs will be submitted to NMFS for approval prior to deployment on the project.

PSOs and PAM Operators will have completed HUET / Sea Survival training with CA-EBS.

PSOs and PAM Operators have completed the BSEE Marine Debris training.

PSO and PAM Operators have completed an Offshore Safety Awareness training.

PSO and PAM operators will be equipped with Personnel Protective Equipment (PPE), including hard hat, lace up steel-toe boots, fire-retardant coveralls, work gloves, and safety glasses.

4 MONITORING EQUIPMENT

4.1 Visual Monitoring Equipment

The PSO on duty will monitor for marine protected species using the naked eye, hand-held reticle binoculars and bigeye binoculars as described in BO.

Digital camera equipment, including zoom lens that is at least 300 mm or the equivalent on a full frame camera, will be used to record sightings and verify species identification.

4.2 Acoustic Monitoring Equipment

4.2.1 PAM System

Two complete PAM systems will be deployed on the *Diamond Ocean Blackhawk*. Only one PAM system will be active, and the hydrophone cable will be deployed from a location that does not hinder operations and provides optimal acoustic coverage. A rig and survey specific deployment and retrieval procedure will be developed between the Lead PAM Operator and vessel crew. A "Permit to Work" will be secured, and a risk

assessment, as implemented by ship management (e.g., Task-Based Risk Assessment (TBRA), Job Safety Analysis (JSA), etc.) will be completed prior to hydrophone deployment.

The Seiche-designed PAM system consists of a 100-meter hydrophone array cable, electronic processing unit (EPU), headphones, and laptop running PAMGuard Beta 64 will be used in PAM monitoring. The vertically deployed array cable, shown in Apx B Figure 2, contains a single hydrophone element with a frequency response of 20 Hz through 150 kHz, a wide band channel sensitivity of -166dB re1V/µPa, and a low frequency channel sensitivity of -157dB re1V/µPa.

The PAM system has been designed to monitor for most cetacean species found in the Gulf of Mexico, covering a broad range of frequencies up to 200kHz. The predominant vessel noise (dynamic position thrusters and other active machinery on the ship) can be filtered out by raising the minimum frequency threshold at which PAMGuard displays vocalizations to 2 kHz, if/as necessary. Some thruster and machinery noise will still dominate the lower frequencies, but the species of concern should all be detectable above the noise as their dominant frequencies are around the 8 to 20 kHz ranges.

Mid- and high-frequency marine mammal vocalizations are processed by the PAM laptop's internal sound card. Mid-frequency vocalizations include sperm whale click trains and codas, and delphinid whistles in the frequency range of approximately 2 kHz to 24 kHz. Kogia species, beaked whales, and delphinid echolocation clicks that are emitted at very high frequencies in excess of 80kHz are processed by a specialized sound card in the buffer unit, an external National Instruments sound card, capable of sampling audio at 500kHz. PAM equipment specifications are provided in Appendix B.

4.2.2 PAM JSA and PAM deployment and retrieval procedure

A job safety analysis (JSA) will be completed prior to hydrophone deployment. The Lead PSO/PAM Operator will develop, in cooperation with the vessel crew, a vessel-specific deployment and retrieval procedure that considers both the minimization of entanglement risks with other equipment while maximizing the acoustic range of the system.

4.2.3 Distance estimation of acoustic detections

Experienced PAM Operators can make a distance estimation assisted by the noise or detection score system developed by Gannier et al. (2002). Gannier et al. monitored sperm whales in the Mediterranean both visually and acoustically. A scale was developed based upon the strength or intensity of the sperm whale clicks at various distances that were then measured when the sperm whales surfaced and were visually observed. Although the scale is subjective, and sounds produced in marine environments will vary according to local conditions, the scale provides a measure for approximating distances when using a single, linear hydrophone array.

5 VISUAL AND ACOUSTIC MONITORING PROCEDURES

NOTE: Visual and Acoustic monitoring must be consistent, diligent, and free of distractions for the duration of the watch.

5.1 Visual Monitoring Watches

There will be **at least two PSOs on visual watch** during:

- All seismic source activity in daylight hours, including testing
- During search periods prior to activating the seismic source
- **For the duration of any day when there is planned acoustic source activity, whether or not the source is deployed**

While the Biological Opinion allows for one person watches, **only under the listed conditions below, no one person watches can occur without this project's RPS PM approval.**

- Acoustic source is not operating and no plans of operating during the day

  AND

- Monitoring condition is “poor” (poor conditions are defined in the BO as Beaufort Sea State (BSS) of 4 or more)

Visual monitoring will begin 30 minutes before sunrise and continue until 30 minutes after sunset.

The following guidelines will apply to these watch periods:

- No additional duties may be assigned to the PSO during his/her visual observation watch
- No PSO will be allowed more than **two consecutive hours on watch** before being allocated a one-hour break from visual monitoring
- No PSO will be assigned a combined watch schedule of more than 12 hours in a 24-hour period

The PSOs will stand watch in a suitable location that will not interfere with the navigation or operations of the ***Diamond Ocean Blackhawk*** and that affords an optimal view of the sea surface. PSOs will maintain 360° coverage surrounding the ***Diamond Ocean Blackhawk*** and the seismic source.

If a protected species is observed, the PSO should first take care of any necessary mitigation actions, or if no mitigation actions are required, they will note and monitor the position (including latitude/longitude of the vessel and relative bearing and estimated range to the animal) until the animal dives or moves out of visual range of the observer.

5.2 PAM Watches

The Lead PAM Operator on the source vessel will have duties that include any technical onboard tasks with the PAM system, scheduling for the whole team, and reporting.

- **PAM monitoring will begin no less than 30 minutes prior to any source activity and continue for one hour after source activity has ended.**

During acoustic monitoring watches, the following guidelines shall be followed:

- No additional duties may be assigned to the PAM Operator during their acoustic monitoring watch
- No PAM Operator will be allowed more than **four consecutive hours of acoustic monitoring** before they will be allocated a break of two hours
- No person on watch as a PSO or PAM Operator will be assigned a combined watch schedule of more than 12 hours in a 24-hour period

5.2.1 Procedures for PAM System Malfunction

If a PAM system is not functional for the purposes of mitigation monitoring, whether because of malfunction with the cables, electronics, monitoring software or another issue, the PAM Operator is permitted **30 mins to diagnose the issue** without the need to shut down the source array.

During daylight when PSOs are also on watch, IF the problem is diagnosed in the first 30 minutes of PAM downtime, an additional 2 hours is permitted to conduct repairs while seismic operations continue **if all the following conditions are met:**

1. The sea state at the time of the malfunction is B4 or less.

   AND

2. There were no acoustic-ONLY detections of marine mammals other than delphinids inside the applicable EZ in the 2 hours preceding the malfunction.

NOTE: The above permission to continue operations applies to an active acoustic source on the production shot point interval BUT does not include activations of the source from silence. PAM is

required to clear from silence for both ramp up after long silences and returns to full volume after short silences. If the source is silenced, it may not resume shooting until the PAM system is brought online and a 30-minute clearance search is conducted.

Operations conducted without ongoing acoustic monitoring **may not exceed a total of 4 hours in a 24-hour period**.

NMFS and BSEE must be notified as soon as is practicable of any PAM system malfunctions. Reporting procedures are outlined in the Reporting section of this EMP.

6 PROJECT BRIEFING

The PSO/PAM team and any *Diamond Ocean Blackhawk* crew who have involvement in the seismic operations shall participate in a project briefing that includes communication procedures, monitoring requirements and operating protocols.

The briefing should be repeated every time relevant new personnel join the crew before operations begins.

7 MITIGATION PROCEDURES: STRIKE AVOIDANCE

The BO contains strike avoidance procedures that apply to protected species in the Gulf of Mexico, but they are not relevant to this exploration activity, as it will take place from a stationary drillship, physically attached to the ocean floor.

8 MITIGATION PROCEDURES: SOUND SOURCES

8.1 Sound Source Exclusion Zones and Buffer Zones

Two types of zones will be established around the seismic sources, both radii that extend from the outer edge of the VSP.

1,500 in3 and 2,400 in3 array Buffer Zones (BZ): Applicable during the pre-clearance search periods conducted prior to initiating the sound source from silence, where detections of a protected species inside it's applicable BZ during the search will result in a delay to activating the source.

1,500 in3 and 2,400 in3 array Exclusion Zones (EZ): Applicable once the source has been activated, where detections of a protected species inside it's applicable EZ will result in a shutdown of the sound source.

Source	Mitigation Zones	
	Buffer	**Exclusion**
2400 in^3	**1500 meters:** All true whale species (Rice's (Bryde's) whales, baleen whales, sperm whales, Kogia species and all beaked whales) **1000 meters:** All other marine mammals and sea turtles	**1500 meters:** All true whale species (Rice's (Bryde's) whales, baleen whales, sperm whales, Kogia species and all beaked whales) **500 meters:** All other marine mammals and sea turtles

1500 in^3	**500 meters:** All true whale species (Rice's (Bryde's) whales, baleen whales, sperm whales, Kogia species and all beaked whales) **200 meters:** All other marine mammals and sea turtles	**500 meters:** All true whale species (Rice's (Bryde's) whales, baleen whales, sperm whales, Kogia species and all beaked whales) **100 meters:** All other marine mammals and sea turtles

To activate the sound source, a minimum of a 30-minute search period must be conducted.

During the daytime, the search will be conducted visually by the PSOs and acoustically by the PAM Operator.

During nighttime, the search will be conducted acoustically by the PAM Operator.

PSO and PAM on watch should be notified of the intent to turn on the source from silence, either to conduct a ramp-up or for testing, at least 60 minutes prior to the planned start.

8.2 Delays to Initiation of the Seismic Source

If any marine mammal or sea turtle was detected inside its respective Buffer Zone during the 30-minute search period, initiation of the seismic source must be delayed until:

- All marine protected species that were observed inside the relevant BZ have been confirmed by the visual observer to have exited the relevant BZ
- 15 minutes from last detection for small odontocetes if not observed exiting the BZ
- 30 minutes from last detection for all other protected species, including sea turtles, if not observed exiting the BZ
- 30 minutes from last detection for acoustic-only detections

NOTE: Both the 30-minute pre-clearance search period and the mandatory delay for animals not seen exiting the BZ must be completed before source initiation, but the pre-clearance search and delays can be implemented concurrently (they overlap). For a delay period that ends BEFORE the clearance search period is completed, the BZ will be cleared when the clearance search is completed. For a delay period that ends AFTER the standard clearance search period is completed, the source can be turned on when the delay period is completed.

8.3 Ramp-Up Procedure and Testing

The intent of ramp-up is to warn marine mammals and sea turtles of pending seismic operations and to allow sufficient time for those animals to leave the immediate vicinity.

For all acoustic source activity, including source testing involving more than one airgun element, ramp-up procedures must be conducted to allow marine mammals and sea turtles to depart the exclusion zone before surveying begins.

Ramp-up is not required for testing of single elements but requires completion of the pre-clearance search.

Ramp-up should be planned in an effort to minimize time that the source is active while being brought into position at the next acquisition level.

Acoustic source activation may only occur at times of poor visibility (including night) where operational planning cannot reasonably avoid such circumstances.

Ramp-up procedures are as follows:

- The operator must notify a designated PSO of the planned start of ramp-up as agreed upon with the lead PSO; the notification time should not be less than 60 minutes prior to the planned ramp-up in order to allow the PSOs time to monitor the BZ for 30 minutes prior to the initiation of ramp-up (pre-clearance).
- Visually and acoustically (day) or acoustically (night) monitor the BZ and adjacent waters for the absence of marine mammals and sea turtles for at least 30 minutes before initiating ramp-up procedures.
- If no protected species are visually and/or acoustically detected inside their respective BZs, ramp-up procedures may begin. If animals are detected, refer to Section 8.2 for procedures to clear the BZs prior to start of source operations.
- Seismic personnel confirm with PSOs on watch (daytime) and/or PAM Operator (day and night) that the BZs are clear of protected species.
- Ramp-up begins by activating a single airgun of the smallest volume in the array.
- Continue ramp-up in stages by doubling the number of active elements at the commencement of each stage, with each stage of approximately the same duration.
- Total duration of the ramp-up should not be less than 20 minutes.

8.4 Protected Species Shutdown Procedures

If any **marine mammal** is detected visually or acoustically within its EZ, an immediate shutdown of the seismic source is required.

The shutdown requirement is waived under the following circumstances:

1. Shutdown is not required for dolphins of the following genera: *Steno, Tursiops, Stenella,* and *Lagenodelphis.*
2. Shut down is not required for acoustic detections of delphinids inside the EZ unless the PSO or PAM Operator can confirm that the dolphin(s) present are from a different genus than those listed above.

If there is uncertainty regarding identification (i.e., whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived or one of the species with a larger exclusion zone), visual PSOs should use best professional judgment in making the decision to call for a shutdown.

The vessel operator must comply immediately with any shutdown request made by a PSO and/or PAM Operator. Any discussion can occur only after the shutdown has been implemented.

Subsequent restart of seismic source may only occur following clearance of the EZ of all marine protected species under the following conditions:

- When all marine mammals have been confirmed by the visual observer to have been seen exiting the relevant EZ (not BZ)
  OR
- When a marine mammal was not observed exiting the EZ, an additional 30 minutes has elapsed following the last detection inside the EZ.

NOTE: All resumptions of source activity following a protected species shutdown must begin with a ramp-up.

8.5 Short Breaks in Source Operations

8.5.1 Daylight Operations

In recognition of occasional short periods of silence for a variety of reasons, other than for mitigation, the seismic source may be silenced for periods of time not exceeding 30 minutes in duration and may be restarted at the same volume for operations without a ramp-up if:

1. Visual and acoustic monitoring (daytime) and acoustic monitoring (nighttime and other reduced visibility) is continued diligently through the silent period

   AND

2. No marine protected species are visually observed in their respective EZ during the silent period, and no acoustic detections made **at any distance**

NOTE: Procedures for returning to full volume without ramp-up after silent periods also apply to returning to full volume from reduced volume.

For example, if two of three strings were silenced from full volume for the purpose of testing single strings, and testing was completed in less than 30 minutes, the array could return to full volume without a ramp-up provided that the conditions described above were met.

However, if the source were operating at that reduced volume for more than 30 minutes, **a ramp up would be required to return to full volume.**

8.5.2 Night-time

In recognition of occasional short periods of silence for a variety of reasons other than for mitigation, the seismic source may be silenced for periods of time not exceeding **10 minutes in duration** and may be restarted at the same volume for operations without a ramp-up if:

1. Acoustic monitoring (nighttime) is continued diligently through the silent period

   AND

2. No acoustic detections have been made **at any distance**

NOTE: Procedures for returning to full volume without ramp-up after silent periods also apply to returning to full volume from reduced volume.

8.6 Non-acquisition and Non-Testing Source Activity

The acoustic source should be deactivated when not acquiring data or preparing to acquire data, except as necessary for testing. Unnecessary use of the acoustic source shall be avoided.

9 REPORTING

9.1 Incident Reporting

9.1.1 Potential Non-Compliance Incidents

The Lead PSO or Lead PAM Operator verbally informs the Anadarko Petroleum Party Manager of any potential compliance related issues immediately. The Lead PSO/PAM Operator also informs the RPS Project Manager (PM) immediately of all potential non-compliance events.

If the issue can be resolved between the Lead PSO/PAM Operator, Anadarko Petroleum Representative and Party Manager, the lead PSO/PAM Operator will document in writing the compliance issue and the agreed-upon practices for minimizing future non-compliance incidents of the same nature. The Party Manager and QC Representative will review and approve, and the statement is submitted to the following distribution list:

RPS PM: Islam Ibrahim (Islam.Ibrahim@tetratech.com)

Jacqueline Colborne (Jacqueline_Colborne@oxy.com)

Christopher Moyer (Christopher_Moyer@oxy.com)

Joseph Grimball (Joseph_Grimball@oxy.com)

Sarah Naone (Sarah_Naone@oxy.com)

Michael Chisam (Michael_Chisam@oxy.com)

Guillaume Richard (Guillaume_Richard@oxy.com)

Eddie Borden (Eddie_Borden@oxy.com)

GOM Regulatory (#GOM-Regulatory@oxy.com)

The representatives listed above will distribute any pertinent information resulting from the incident to their respective crews as deemed necessary and appropriate.

If the issue cannot be resolved at the vessel level, Anadarko Petroleum and RPS will discuss and determine the appropriate future actions to be taken. When a common position is reached, notification of the agreed procedures will be distributed by Anadarko Petroleum to vessel crew and by RPS to the PSOs and PAM Operators.

If an agreement cannot be reached at the office level, a Anadarko Petroleum representative will contact BOEM/NMFS/BSEE for clarification. Results from the clarification will be distributed by Anadarko Petroleum.

9.1.2 Reporting A Non-functioning PAM System During Seismic Operations

The PAM Operator on duty will notify the RPS PM, who will collect details and notify NMFS and BSEE via email (nmfs.psoreview@noaa.gov and protectedspecies@bsee.gov, respectively) as soon as is practicable.

The notification will include the vessel name, the time and location (GIS position) in which the PAM system ceased to function and where seismic operations continued.

The PAM Operator will also notify by email:

- The vessel Party Chief
- The Anadarko Petroleum Representative

9.1.3 Injured or Dead Protected Species Reporting

1. The PSO on watch will report the sightings of a dead and/or injured marine species to the Lead PSO, the RPS project manager, onboard company man, and the onboard wellsite geologist as soon as is practicable after the sighting.
2. The RPS PM will report the sighting to the appropriate stranding hotline. This will occur as soon as practicably possible but no more than 24 hours of the detection. The RPS PM will continue until contact is made.
3. A written report will be prepared including any photos taken of the animal and sent to RPS as soon as possible.
4. The RPS office will submit the written report to the following distribution list within 12 hours of the detection for review:

   On-board:
   - Wellsite Geologist
   - Company Man

   On-shore:

- Jacqueline Colborne, Chirstopher Moyer, Michael Chisam, Joseph Grimball, Guillaume Richard

RPS will provide the written report, once the draft has been reviewed and approved per above, to NOAA, NMFS, and BOEM with Anadarko Petroleum in copy.

NOTE: Unless otherwise directed by BOEM, NOAA Fisheries, or NOAA, the dead or injured marine mammal or sea turtle SHOULD NOT be touched! Dead and injured marine mammals and sea turtles are still protected by the ESA and the MMPA and touching the animals in any manner is considered harassment and is punishable by law.

Reporting requirements are specific by species group. There is a stranding hotline contact for marine mammals, sea turtles and other protected species (e.g., giant manta ray, oceanic whitetip shark, or Gulf sturgeon). These notifications will be made by the RPS PM to the appropriate source based on the species incident.

9.2 Daily Progress, Interim and Final Reporting

9.2.1 Interim Reports

RPS will submit interim reports in the format of an excel spreadsheet for each vessel containing the required information listed in the BO.

RPS will submit interim reports (a dataset in a format approved by NMFS and BSEE) on the 1st of each month to BSEE (protectedspecies@bsee.gov).

9.2.2 Final Report

RPS will develop a final report summarizing the survey activities and all PAM / PSO observations. The report will contain all the data required to meet the requirements of the BO.

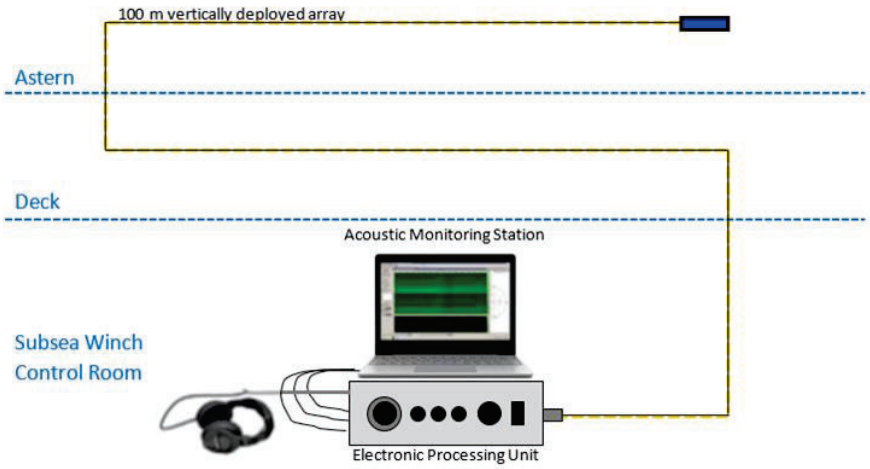
The RPS PM will provide the draft final report to the Anadarko Petroleum Project Manager within 30 days of project completion.

Appendix A: LOA

Appendix B: PAM Equipment Specifications

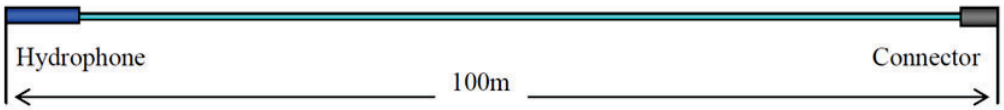
B.1 Passive Acoustic Monitoring (PAM) Parameters

A PAM system designed to detect most species of marine mammals was installed on the Drill Ship *Diamond Ocean Blackhawk*. The system was developed by Seiche Measurements Limited and consisted of the following main components: a 100 m hydrophone cable, electronic processing unit (EPU), headphones, and a laptop running PAMGuard64. A complete, spare PAM system was also onboard in case of technical malfunctions. Figure 1 is a simplified depiction of the PAM system installed on the *Diamond Ocean Blackhawk* during the survey.



Apx B Figure 1: Simplified pathway of data through the PAM system onboard the *D/S*

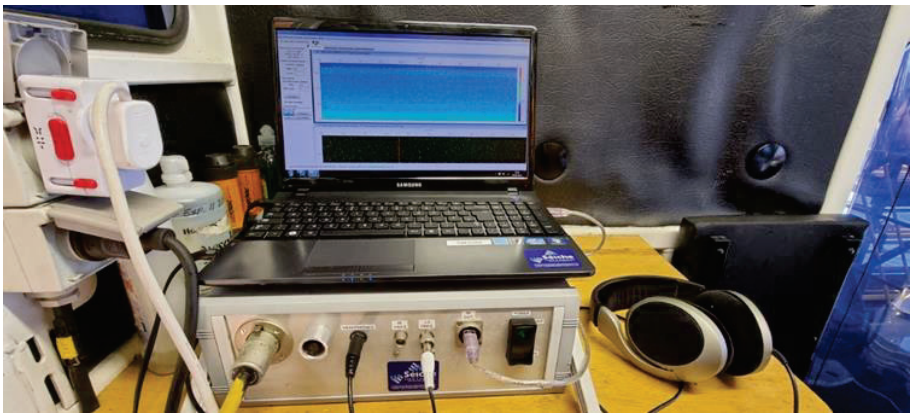
The vertically deployed array cable, shown in Apx B Figure 2, contained a single hydrophone element with a frequency response of 20 Hz through 150 kHz, a wide band channel sensitivity of -166dB re1V/µPa, and a low-frequency channel sensitivity of -157dB re1V/µPa.



Apx B Figure 2: Hydrophone array detail

The EPU served as an interface between the hydrophone cable and the laptop. The raw audio signal from the hydrophone element is transmitted through the buffer unit to two sound cards for processing and analysis. The lower range of frequencies, from 5-24 kHz, were captured with the laptop's internal sound card at a sampling rate of 48 kHz. The higher frequency ranges, up to 250 kHz, were captured on a National Instruments data acquisition sound card at a sampling rate of 500 kHz within the EPU. The analogue signal is converted into a digital signal and fed via the USB socket to the laptop for display.

The PAM operator conducted acoustic monitoring at a local monitoring station inside the subsea winch control room (Apx B Figure 3).



Apx B Figure 3: Passive Acoustic Monitoring station

Appendix C: Survey Drillship Photos

Figure 1: *D/S Ocean Blackhawk* (courtesy of marinetraffic.com)

Appendix D: PSOs and PAM Operators

Approved RPS PSO/PAM Names
Jason Herr
Marah Garcia
Fernando Diaz
Elsy Olivares
Sandra Pina
Caleb Sistrunk
Alexander Vest

Appendix E: Drillship Specific PAM Deployment Procedures

D/S *Diamond Ocean Blackhawk* Hydrophone Deployment

1.1 Configuration / Methodology

The *D/S Diamond Ocean Blackhawk* is using a static deployment of a Seiche single element 1-channel hydrophone cable. The hydrophone cable is deployed manually from the Main Deck on the starboard side, aft of mid-ship below the port aft crane pedestal. The hydrophone cable was measured and secured to the handrail using zip ties and electrical tape. A service loop was employed to prevent damage and relieve tension on the cable. (Figure 1).

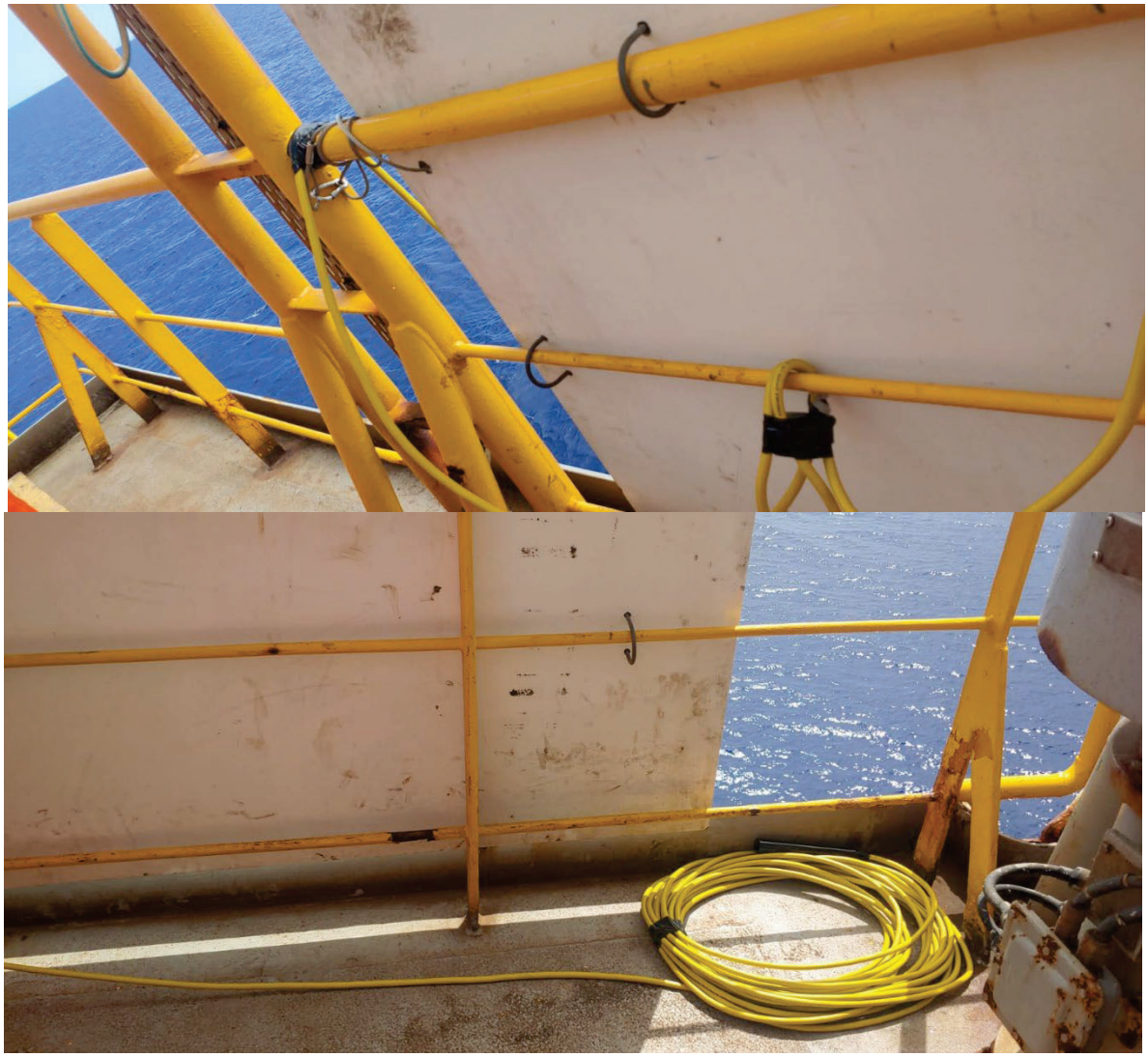


Figure 1: PAM cable deployment

The simple hydrophone array was deployed 15 meters above the water line and allowed to hang freely, with the potential for the end of the cable to reach depths of 10 meters below the bottom of the ship's hull. The cable is comprised of one hydrophone element and there is no depth sensor hence, distance calculation to the vocalizing animals while the vessel was stationary were PAM operator estimates based on registered amplitudes.

1. The segment of the hydrophone cable in direction of the connector was run along the handrail, then along the riser deck and into the container. It was secured to the handrail with cable ties (zip ties) and then run along a raised deck rail to prevent tripping hazards or damage to the cable. The end of deck cable was run through a multiple-cable transit block on the wall to the PAM station in the container (Figure 2). The vessel remained stationary during the entirety of the project and the coordinates were retrieved from the bridge.

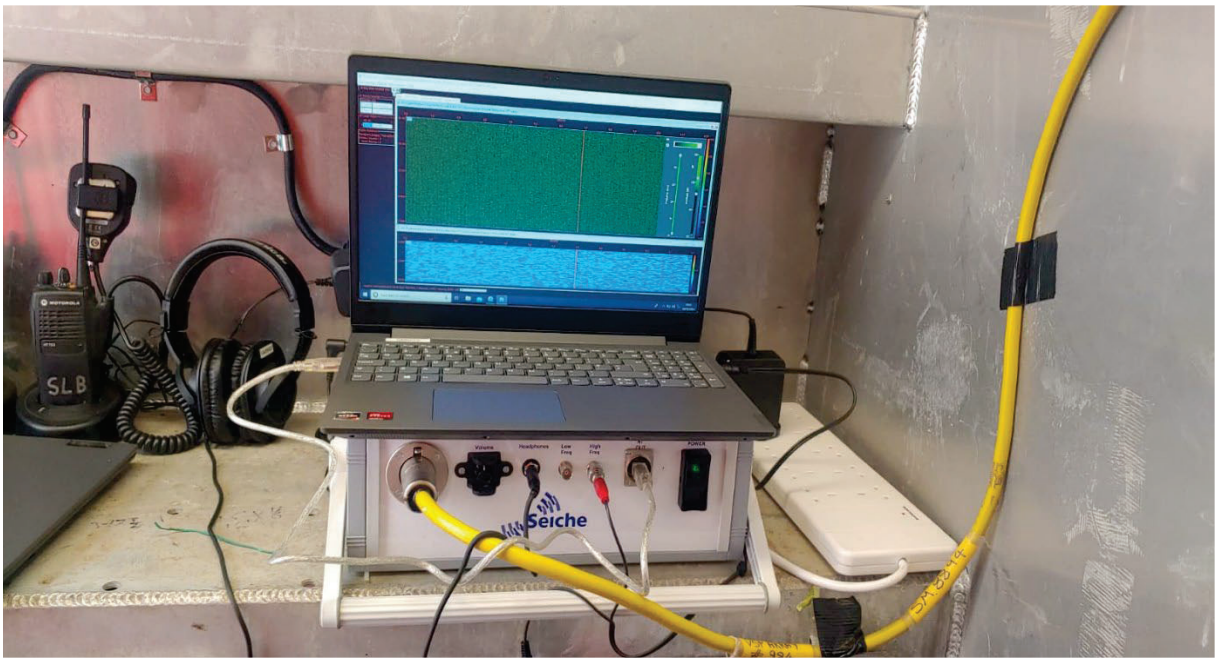


Figure 2: PAM station in Schlumberger container.

1.2 Procedures

Before installation, main and spare sets of the PAM system were tested. Installation and derigging were preceded by a Task Based Risk Assessment and the approval of the corresponding Permit to Work. Deployments and retrievals were conducted after a toolbox meeting. All deployments and retrievals were conducted by at least two people, per vessel safety regulations for operating on the deck while at sea, including the Lead PAM Operator and a support personnel (other PAM Operator, PSO, or crew). Proper PPE was employed at all times, including safety boots, safety glasses, impact gloves, and hard hat with a chin-strap.

1.2.1 Deploy PAM Cable

Before turning on the electronics of the system, the simple array cable is freed and it has been confirmed that it is not entangled, then the lead person of the task will direct the support person to deploy cable manually overside starting with the single-hydrophone end. The connector side of the cable always remain inside the PAM station and the cable is secured once deployed, thus the cable is always secure to the vessel to avoid feeding more cable than planned.

Figure 3: PAM cable deployed.

1.2.2 Housekeeping

When the hydrophone array is retrieved, it is coiled and secured in a watertight case on deck. The case itself was also secured to the vessel to prevent any possibility of marine debris, as well as not to present a tripping hazard.

1.2.3 Retrieving PAM Cable for Transit

The deployment configuration is designed for a stationary position of the vessel, not for a towed system. During the project there were no periods where the vessel was transiting while PAM monitoring was being conducted. If there were no seismic operations the cable was recovered to avoid any potential damage to the equipment or entanglement with the vessel.

1.2.4 Communication

One VHF radio was provided by the seismic crew for PAM use. The VHF radio was utilized for communication between the PAM operator, PSOs on daytime visual watch, seismic crew during source operations, and bridge during deployments/retrievals. The D/S *Diamond Ocean Blackhawk* source operators and PAM/PSOs were always in constant and instant communication.

Appendix F: PSO Data Sheets of Effort, Operations, and Detections

Appendix G: Required Attendees at PSO Briefing

Required Attendees at PSO Briefing

Name	*Position*	Affiliation
Jason Herr	Lead PSO	RPS
Marah Garcia	PAM	RPS
Sandra Pina	PSO	RPS
Elsy Olivares	PAM	RPS
Fernando Diaz	PAM	RPS
Caleb Sistrunk	PSO	RPS
Alexander Vest	PSO	RPS
Robbie Thas	HSE Advisor	DODI
John Allen	Captain/OIM	DODI
Cameron Whitten	Company man	DODI
Cody Thorp	Safety Operations	DODI
Clayton Jenkins	HSE Advisor	Oxy
Dustin Duplantis	Seismic Operator	SLB
Wilsey Bordelon	Seismic Operator	SLB

Appendix H: PAM Calibration Certification

1 SM.8894 SYSTEM FREQUENCY RESPONSE

We provide calibration values so that realistic sound level and signal amplitudes values can be displayed in PAM software. The frequency response of the preamplifier output signal is plotted below, and calibration settings are provided for use in PAMGuard. Table 1 provides -3 dB and -6 dB points of the frequency response curve. These points delimit the 'flat' portion of the response curve.

Hydrophone	Sensitivity	-3 dB points	-6 dB
H1	-155.8 re: 1 V/µPa	16-25,000 Hz	10-40,000 Hz

Table 1: Frequency points for -3 dB and -6 dB sensitivity, for representative hydrophones of each group.

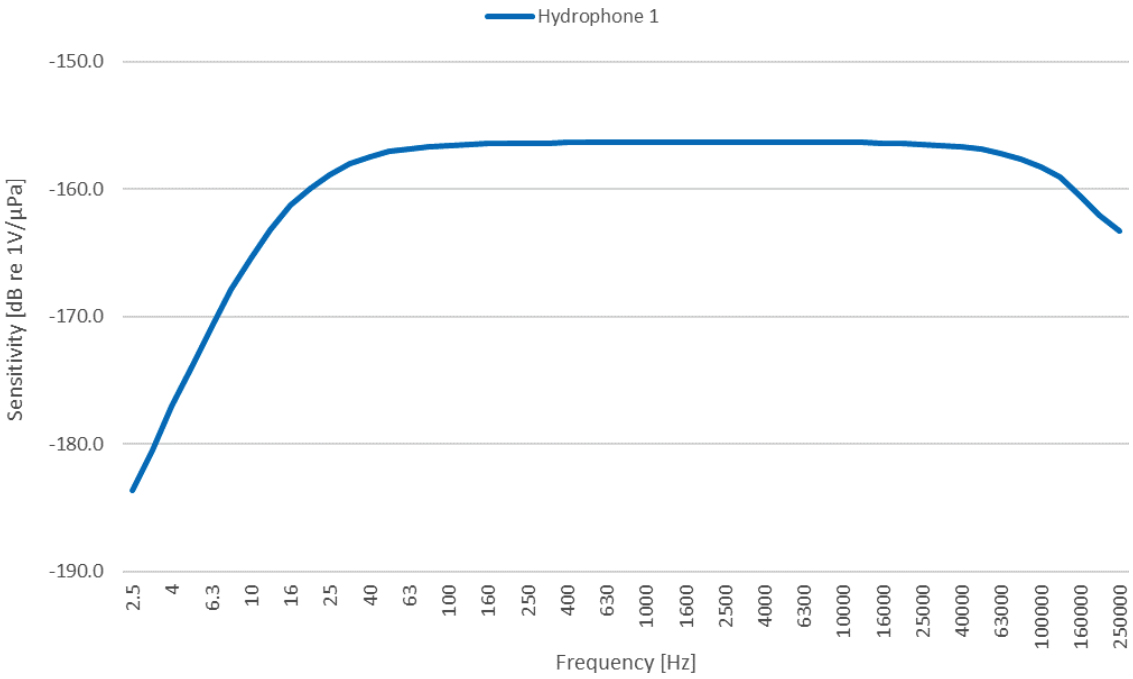


Figure 1: Frequency response curve showing the sensitivity of the output of the WB preamplifier.

2 CALIBRATION VALUES FOR PAM SOFTWARE

2.1 PAMGuard Array Manager

H1 (Ch0, 0.01-24 kHz) Sensitivity = -196.3 dB re: 1 V/uPa, Preamplifier Gain = +40.5 dB

2.2 PAMGuard Sound Acquisition

NI USB-6251

Data Source Type National Instruments DAQ Cards

Select Audio Line NI USB-6251 (dev1)

Terminal Configuration Referenced single-ended

Input Voltage Range 2 V (set as +/- 1 V per channel)

Additional System Gain 0 dB

Channels SW Ch0 / HW Ch0

Sample Rate up to 500 kHz

Sample Size 16 bit

2.3 Behringer UMC202HD

Data Source Type ASIO Sound Cards

Select Audio Line UMC ASIO Driver

Input Voltage Range (p-p)V

Additional System Gain 0 dB

Map Channels SW Ch0 / HW Ch0

Sample Rate ..48-192 kHz

Sample Size 24 bi

1 SM.8895 SYSTEM FREQUENCY RESPONSE

We provide calibration values so that realistic sound level and signal amplitudes values can be displayed in PAM software. The frequency response of the preamplifier output signal is plotted below, and calibration settings are provided for use in PAMGuard. Table 1 provides -3 dB and -6 dB points of the frequency response curve. These points delimit the 'flat' portion of the response curve.

Hydrophone	Sensitivity	-3 dB points	-6 dB
H1	-156.3 re: 1 V/µPa	16-25,000 Hz	10-40,000 Hz

Table 1: Sensitivity of the H1 channel and frequency points for -3 dB and -6 dB sensitivity.

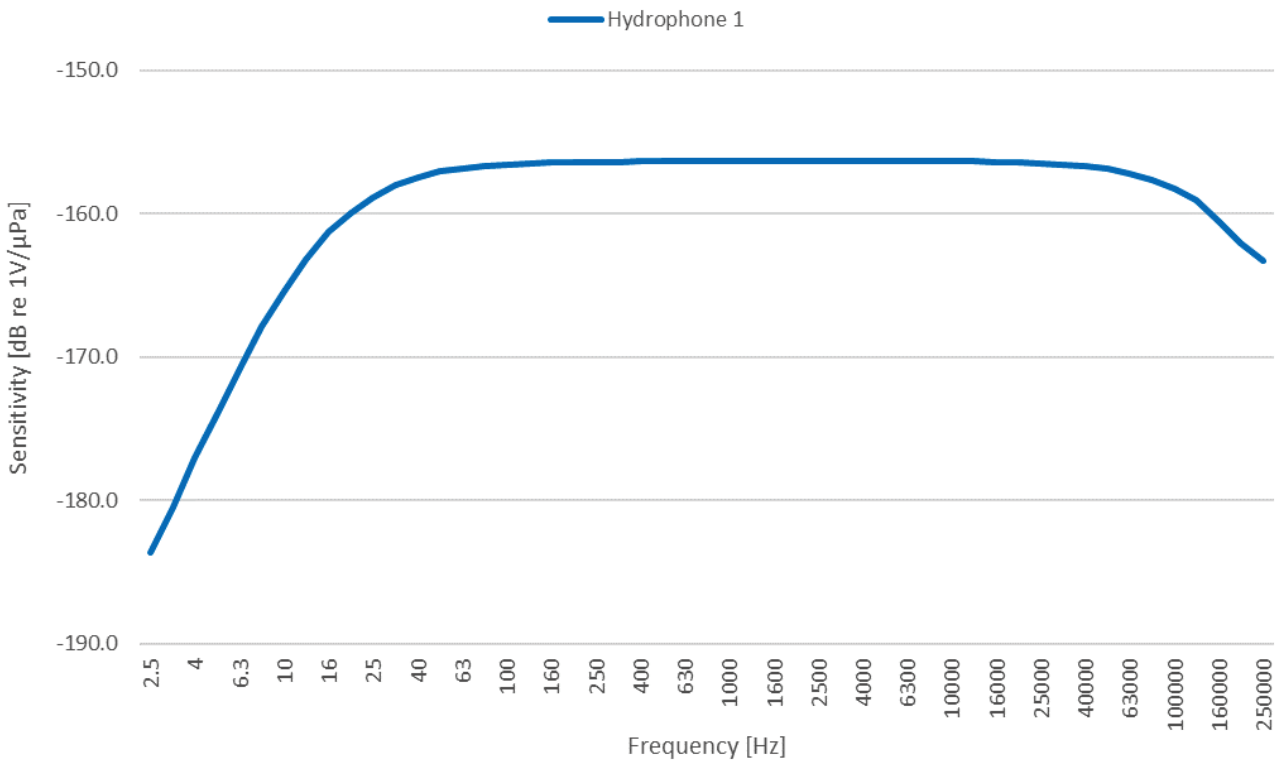


Figure 1: Frequency response curve showing the sensitivity of the output of the WB preamplifier.

2 CALIBRATION VALUES FOR PAM SOFTWARE

2.1 PAMGuard Array Manager

H1 (Ch0, 0.01-24 kHz) Sensitivity = -196.7 dB re: 1 V/µPa, Preamplifier Gain = +40.5dB

2.2 PAMGuard Sound Acquisition

NI USB-6251

Data Source Type National Instruments DAQ Cards

Select Audio Line NI USB-6251 (dev1)

Terminal Configuration Referenced single-ended

Input Voltage Range 2 V (set as +/- 1 V per channel)

Additional System Gain 0 dB

Channels SW Ch0 / HW Ch0

Sample Rate up to 500 kHz

Sample Size 16 bit

2.3 Behringer UMC202HD

Data Source Type ASIO Sound Cards

Select Audio Line UMC ASIO Driver

Input Voltage Range (p-p)5 V

Additional System Gain 0 dB

Map Channels SW Ch0 / HW Ch0

Sample Rate ..48-192 kHz

Sample Size 24 bit

Appendix I: Photographs of Protected Species Visually Detected During the Survey

VISUAL DETECTIONS FOR *D/S Ocean Blackhawk*

Figure 1. Visual Detection #1: Rough-toothed dolphin 11 May 2024

Figure 2. Visual Detection #2: Rough-toothed dolphin 12 May 2024

Appendix J: Lead PSO Data Certification

A TETRA TECH COMPANY

REPORT CERTIFICATION STATEMENT

I, Jason Herr, am familiar with the protocols outlined in Appendix A: Seismic Survey Mitigation and Protected Species Observer Protocols, implemented by the Bureau of Ocean Energy Management (BOEM) and Bureau of Safety and Environmental Enforcement (BSEE), which provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361- 1423h).

I hereby certify that, to the best of my knowledge, the data collected by the Protected Species Observer (PSOs) offshore and the information that was provided to RPS by the PSO team for our vessel to compile this report is accurate.

Name: Jason Herr

Position: Lead Protected Species Observer

Date: 05/25/2024

Signed DocuSigned by: Jason Herr 7179A24B4573423...

I, Islam Ibrahim, am familiar with the protocols outlined in Appendix A: Seismic Survey Mitigation and Protected Species Observer Protocols, implemented by the Bureau of Ocean Energy Management (BOEM) and the Bureau of Safety and Environmental Enforcement (BSEE), which provide guidelines to operators in complying with the Endangered Species Act (ESA; 16 U.S.C. §§ 1531-1544) and Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361- 1423h).

I hereby certify that, to the best of my knowledge, the information provided in this report that was compiled by the RPS Project Support Manager is accurate.

Name: Islam Ibrahim

Position: RPS Environmental Project Manager

Date: 05/25/2024

Signed DocuSigned by: islam ibrahim 0FEA342399E8440...