



Neart na Gaoithe Offshore Wind Farm

Unexploded Ordnance – Marine Licence Post Detonation Report

Revision 3.0

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Neart na Gaoithe Offshore Wind Farm Unexploded Ordnance Marine Licence Post Detonation Report

Pursuant to Condition 3.5.3 of Marine Licence (Ref 07103/20/1)

Document Approval

SIGN OFF		
Name (Role)	Signature	Date
Claire Gilchrist Offshore Consents Manager		11/12/2020
Richard Cattermole Project Hydrographic Surveyor		11/12/2020

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Acronyms and Abbreviations

TERM	DESCRIPTION
ADD	Acoustic Deterrent Device
ASW	Anti-Submarine Warfare
EPS	European Protected Species
FFE	Free from Explosives
FRC	Fast Rescue Craft
ID	Identification
ML	Marine Licence
MS-LOT	Marine Scotland Licencing & Operation team
MMO	Marine Mammal Observer
MMMP	Marine Mammal Mitigation Plan
NnGOWL	Neart na Gaoithe Offshore Wind Limited
NEQ	Net Explosive Quantity
ORS	Ordnance Relocation System
PAMS	Passive Acoustic Monitoring Systems
pUXO	Potential Unexploded Ordnance
ROV	Remotely Operated Vehicle
UXO	Unexploded Ordnance

Executive Summary

A total of fifty-three items of unexploded ordnance (UXO) were found across the Neart na Gaoithe (NnG) Offshore Wind Farm area and Export Cable Corridor during a potential unexploded ordnance (pUXO) inspection campaign undertaken between December 2019 and May 2020. A total of 46 UXO items were found in the wind farm area and seven were found on the export cable route. The presence of these UXO represents a significant risk to the safe construction of NnG Offshore Wind Farm. In order to remove this risk, a UXO clearance campaign was completed.

Clearance operations began on site by the survey vessel, *Glomar Wave*, operated by Helix Robotic Solutions Ltd., with the first detonation on the 3rd May 2020, the last detonation on the 8th July 2020 and the campaign completing on 11th July 2020. Between the 14th May and 24th June 2020, noise monitoring was undertaken on the 37 clearances during this period. Unless not required due to the size of the UXO, all clearances followed a soft-start procedure, including the use of Acoustic Deterrent Devices (ADDs). Marine mammal monitoring was undertaken prior to all clearance activities, using Marine Mammal Observers (MMOs) and Passive Acoustic Monitoring Systems (PAMS).

Clearance of UXO items from NnG construction areas in the wind farm and export cable corridor utilised a method of detonation by deploying a 2.5 or 5 kilogram (kg) of High Order Explosives, followed by either wet storage or debris removal, or a combination of both. An initial high order detonation was attempted at each UXO location. Any debris remaining following the detonation attempt which were not possible to declare as safe to recover, or items that did not detonate under the first attempt and also not possible to declare as free from explosives (FFE), were wet stored. Any debris which was safe to recover was retrieved to deck. Of the 53 UXO items, a total of 14 UXOs underwent a high order detonation (leaving no debris), however 34 did not detonate and of these, 14 were wet stored and 20 items were retrieved to deck. Additionally, five underwent a detonation which was not confirmed to be of high-order or was a partial deflagration, and debris remained, requiring wet-storage or retrieval to deck. Of these, two required partial wet-storage due to potential explosive material remaining and partial recovery to deck, whilst two were declared fully safe to be retrieved to deck and one had two fragmented pieces recovered to deck.

Following each detonation, a post-detonation search on the sea surface was completed to identify whether the detonation had resulted in any injured or dead fish or marine mammals. A small quantity of dead fish was seen on the surface after eight detonation events. A post-detonation report was recorded for each of these findings and was sent to Marine Scotland Licensing and Operations Team (MS-LOT) and Marine Scotland Science.

1 Introduction

1.1 Background and Purpose of this Document

1. Neart na Gaoithe Offshore Wind Limited (NnGOWL) recently completed an UXO survey and clearance campaign within the boundaries of the Neart na Gaoithe (NnG) Offshore Wind Farm Site and Export Cable Corridor to prepare for construction activities.
2. The following licences were issued by the Marine Scotland Licensing Operations Team (MS-LOT) in relation to the survey and clearance works:
 - Licence to Disturb European Protected Species (EPS) ('EPS Licence') under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), Refs MS EPS 27/2019/0.
 - Licence to deposit or use any explosive substance or article within the Scottish marine area either in the sea or on or under the seabed and to use a vehicle to remove any substance or object from the seabed within the Scottish marine area ('Marine Licence'), Refs 07103/20/1.
3. The original Marine Licence (07103/20/0) was granted based on a total of 50 UXO requiring clearance. As a result, a Marine Licence variation was requested on the 19th May 2020 following the identification of additional UXO above the consented allowance. Marine Licence 07103/20/1 was granted on 16th June 2020.
4. Condition 3.5.3 attached to the Marine Licence (ML) requires the submission of a post-detonation report by NnGOWL, detailing actions taken in response to the terms and conditions of the licence, to MS-LOT no later than 28 days following the completion of the licenced activities. This report has been prepared in response to that condition and will be submitted to MS-LOT in advance of 8th August 2020.
5. Condition 3.5.3 states that "The Licensee must submit a report stating the nature and quantity of all objects cleared, removed or disposed of during the Licensed Activities and the date and location of each UXO that has been detonated to the Licensing Authority in writing no later than 28 days following the Completion of the Licensed Activities".
6. A table with the full ML conditions and project compliance with each condition is detailed in Appendix A.

1.2 Objectives of this Document

7. As per Condition 3.5.3, this report addresses each of the particular requirements in the following Sections;
 - **Section 1.3** summarises the nature and quantity of all objects cleared.
 - **Section 2** of this document has been structured to explain the debris clearance procedure and presents the UXO clearance results and wet storage locations.
 - **Section 3** provides a marine wildlife recording during the post-detonation search.
 - **Appendix A** details the full ML conditions and project compliance with each condition.
 - **Appendix B** – Marine Mammal Recording Forms provides copies of the MMO recording forms.
 - **Table 2** lists a detailed overview of each UXO cleared as part of the licenced activities.

1.3 Unexploded Ordnance Objects at NnG Offshore Wind Farm

8. UXO are explosive weapons - such as bombs, anti-aircraft projectiles, naval projectiles (for use against ships and submarines) and torpedo's - which have not detonated and pose a risk of an uncontrolled

explosion if construction activity causes disturbance. There are a number of reasons why there might be such weapons in the NnG Offshore Wind Farm site and Export Cable Corridor.

9. Dumping of UXO in the sea in specified locations was a method of disposal after the first and second World Wars. There are two ammunition dumping grounds are mapped within approximately 12km to the south-west of the site, which would have been used to dispose of a range of munitions post-World War II (WWII). It is possible that dumping may have occurred outside of the boundaries of the ground, or that UXO might have moved over time due to tidal currents.
10. The site overlaps within a submarine exercise area which was used by during training prior to the start of World War I. The site's southern boundary encroaches onto a modern Firing Practice Area and the western and southern extents of the site lie within historic and modern Army and Navy firing ranges which were in operation prior to, during and post-WWII.
11. A total of 53 items of unexploded ordnance (UXO) were found across the Neart na Gaoithe (NnG) Offshore Wind Farm area and Export Cable Corridor during a potential unexploded ordnance (pUXO) inspection campaign undertaken between December 2019 and May 2020. A total of 46 were found in the wind farm area and seven were found on the export cable route. The presence of these UXO represents a significant risk to the safe construction of NnG Offshore Wind Farm. These are shown on Figure 1 with the type of UXO shown in the legend.
12. Out of the 53 items, there were 52 detonations attempted. On one occasion two items were cleared with a single detonation.

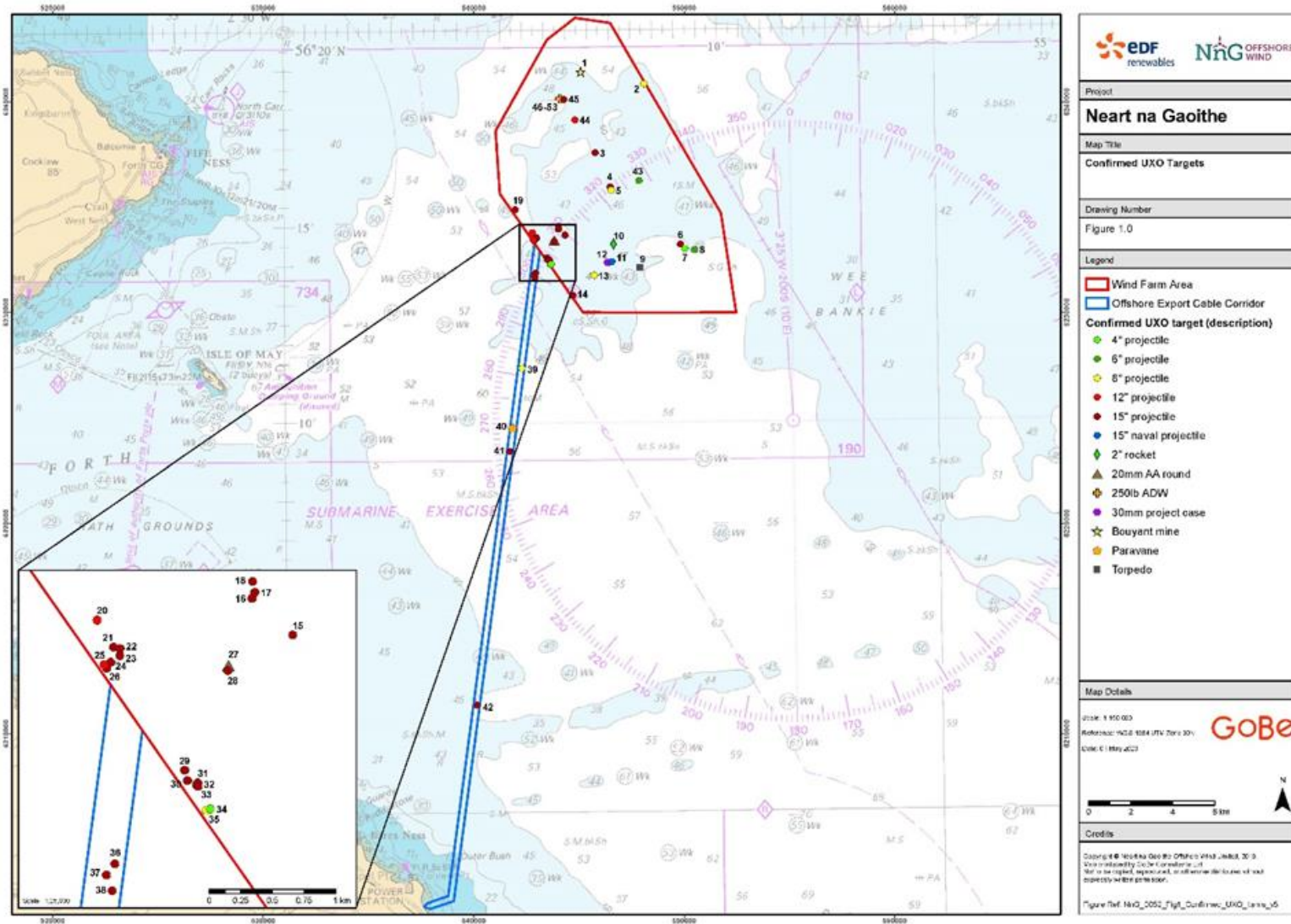


Figure 1 - Overview of UXO found within the boundaries of the NnG Offshore Wind Farm

2 Unexploded Ordnance Clearance Method

2.1 Vessel Details

13. The *Glomar Wave* (Table 1 and Figure 2) was contracted by Helix Robotic Solutions Ltd., on behalf of NnGOWL, to complete the licensed activities. This multi-purpose vessel was used as accommodation for the offshore personnel, for deployment of a remotely operated vehicle (ROV) (which in turn deployed the UXO detonation equipment (a 5kg donor charge), for the post-detonation surveys (using cameras, magnetometer and a very high frequency obstacle sonar) and to recover any debris to deck. In order to initiate the detonation, a Fast Rescue Craft (FRC) was launched from the *Glomar Wave*. From here, the post detonation searches were completed.

Table 1 – UXO Clearance Vessel Details

GLOMAR WAVE VESSEL DETAIL	
Call sign	3FXF4
Draught	5m
Length	65.9m
Width	13.2m



Figure 2 – UXO Clearance Vessel – Glomar Wave

2.2 Detonation Procedure

14. The detonation procedure commenced with the arrival of the vessel at the site of a UXO to conduct an ‘as found’ survey of the confirmed UXO positions from the pUXO inspection survey. A position no less than 50m from the target was acquired by the vessel and a ROV was deployed to commence the ‘as

- found’ survey. This confirmed the UXO target ID, status and position. Once the ‘as found’ survey was completed the EOD supervisor detailed the UXO disposal strategy and confirmed the detonation time.
15. As part of the monitoring strategy MMOs and PAMS operators, were positioned on the vessel for the duration of the licensed activities. Sightings of a marine mammal would temporarily stop work until the marine mammal was clear. There were 23 marine mammal sightings occurred during the campaign, however, works were not required to be temporarily stopped as there were no operations ongoing at the time.
 16. No later than two hours before each detonation, the vessel began to communicate an ‘Securite’ broadcast and MMOs commenced visual monitoring. Within an hour of the planned detonation, MMOs began to undertake initial monitoring alongside towed PAMS equipment. The vessel increased the broadcast frequency of ‘Securitie’ messages as the detonation approached. The deployment and monitoring by PAMS occurred for at least 1 hour prior to detonation.
 17. In conjunction with the vessel broadcasts and marine monitoring procedures, preparation of the donor charge was undertaken; either a 2.5kg or a 5kg slab-charge as shown in Figure 3. This size and position of the donor charge was determined by the Net Explosive Quantity (NEQ) of the UXO, the overall size of the item and the position on the seabed. Once the charge had been prepared on board the vessel, the ROV was launched to place the charge adjacent to the UXO.



Figure 3 – Equipment used for UXO clearance activities

18. At the same time, a confirmation of the level of ‘soft-start’ routine also commenced, dependant on the NEQ of the UXO item. The deployment of the ADD commenced prior to the end of the PAMS period for all detonations;
 - Target <50kg NEQ (including disposal charge): ADD required 15-30 minutes before end of PAMS.
 - Target >50kg (including disposal charge): ADD required 30-40 minutes before end of PAMS.
19. Prior to 28 detonations, a soft-start procedure was also implemented, dictated by the UXO NEQ size, subject to no sightings of marine mammals being reported by the MMO or PAMS operator. If the target NEQ was estimated to be between 50kg-100kg:
 - The first soft-start charge (50g) was activated 15 minutes prior to detonation.
 - The second soft-start charge (100g) was activated 10 minutes prior to detonation.

20. If the UXO target NEQ was estimated as between 100kg-500kg:

- A further, third soft-start charge (150g) was activated 5 minutes prior to detonation.

21. Once the above soft-start procedure was complete, a final confirmation of an absence of marine mammals from a 1500m radius around the UXO was provided.

2.3 Post-Detonation Procedure

2.3.1 Post-Detonation Sea Surface Search

22. Following each detonation, a post detonation search was completed, as per Condition 3.4.2, which states *“Following each detonation, the Licensee must carry out a post-detonation search of the mitigation zone, as detailed in the MMMP (as updated), for at least 15 minutes. Such searches must focus on any affected, injured or distressed marine mammal and any affected, injured, distressed or dead fish”*. This search was conducted by the MMO and the results of any sightings are provided in Section 3.1.

2.3.2 Debris Removal

23. A post-detonation seabed survey was completed using the ROV via visual inspection, sonar and magnetometer to confirm that the UXO has been successfully detonated and locate any associated debris. During this inspection the ROV collected items of blast debris greater than 30 cm in size. Each item of debris was inspected by the ROV prior to recovery to deck to ensure that the items were free from explosives.

24. Debris accumulation can occur after UXO detonation and present a danger to safety and a seabed hazard. A debris removal method was implemented to mitigate the effects of any debris and to comply with Marine Licence Condition 3.5.2.

25. Condition 3.5.2 states that *“The Licensee must ensure that any debris (including any debris from UXO detonation) or waste material, originating during the Licensed Activities is removed from the site. The Licensee must take all reasonable, appropriate and practicable steps to restore the Site to its original condition, or to as close to its original condition as is reasonably practicable, to the satisfaction of the Licensing Authority”*.

26. The charge of 5kg was used to detonate larger UXO items, both in terms of dimensions and NEQ. This was most commonly used to detonate naval projectiles of 102kg NEQ. A 2.5kg charge detonated identified targets such as smaller calibre projectiles (of less than 32.5kg NEQ).

27. Due to the quantity of larger UXO objects on the wind farm site and export cable corridor, a total of 39 5kg slab charges were deployed. A total of 14, 2.5kg slab charge were used to detonate the smaller projectiles identified.

2.4 UXO Removal/Relocation

28. Upon the ROV post-detonation inspection, a large number of items were found not to have high order detonated by using the 5kg donor charge. If an UXO object couldn't be destroyed in-situ after the first attempt at using a high order explosive, then an alternate method of clearance from NnG construction areas was investigated.

29. Following removal, an as-left survey was carried out from the ROV to confirm that there are no further UXO items or debris in the area. The as-left survey was undertaken using cameras, magnetometer and a very high frequency obstacle sonar.

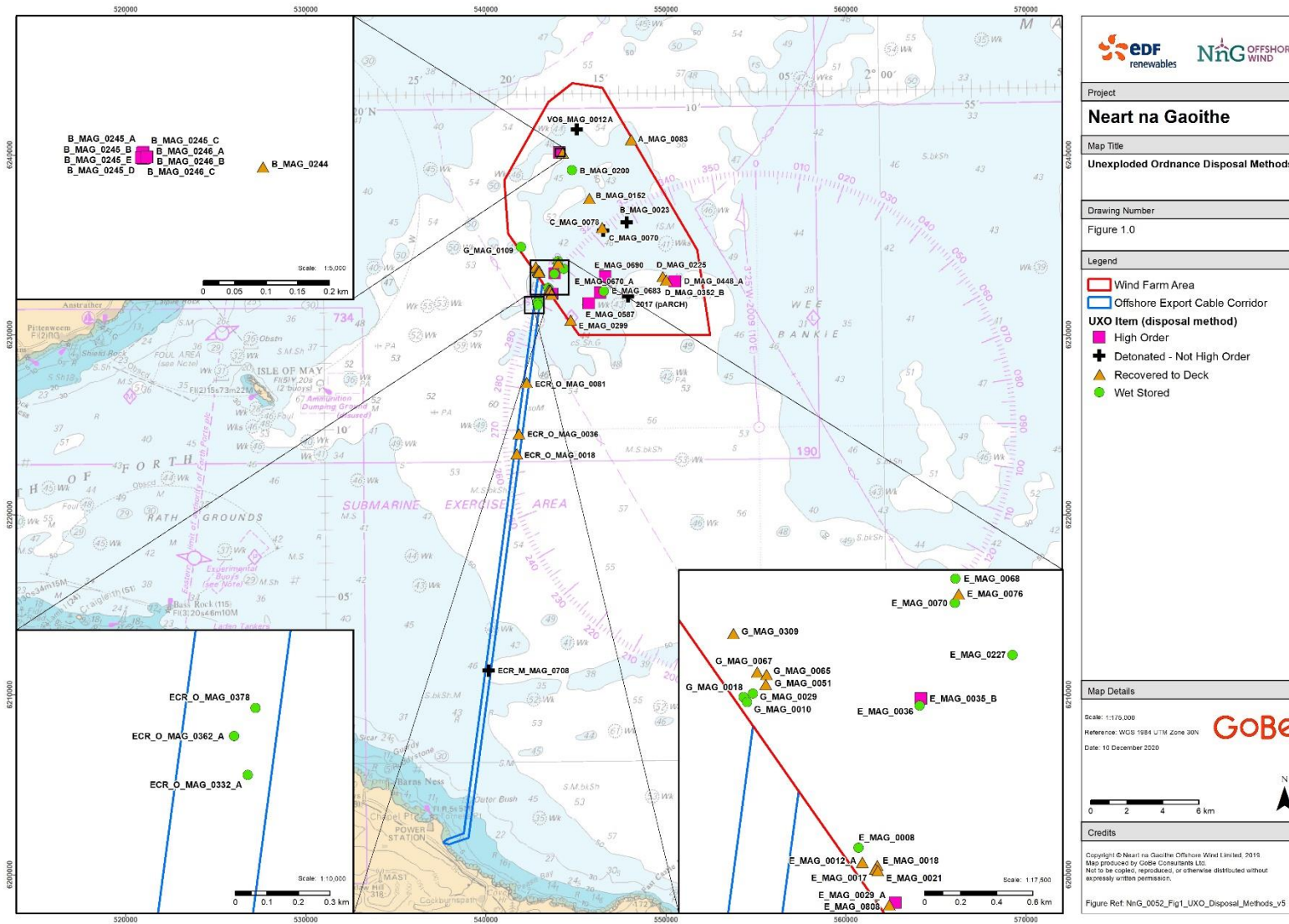


Figure 4 - UXO Item Disposal Method

Table 2 - UXO Clearance Overview

Sequence	UXO Identification	Description	WGS84 (UTM 30)		Soft-Start	Net Explosive Quantity (NEQ)	Depth	Charge weight	ADD (MINS)	Seabed Condition	Date of Detonation	Clearance Method
			EASTING (m)	NORTHING (m)								
1	A_MAG_0083	8" Projectile	548076.30	6240861.40	N/A	10KG	50m	5KG	18	Sand/Silt	03/05/2020	Recovered to deck
2	C_MAG_0070	8" Projectile	546524.50	6235803.40	N/A	10KG	50m	5KG	20	Sand/Silt	04/05/2020	Detonation achieved however not High Order and item wet stored as some explosives material remaining
3	D_MAG_0352_B	4" projectile	550025.51	6233041.87	N/A	Unknown (5KG)	47m	2.5KG	20	Sand/Silt	05/05/2020	Recovered to deck
4	D_MAG_0448_A	6" projectile	550496.10	6232988.30	N/A	2KG	51m	2.5KG	20	Sand/Silt	07/05/2020	High Order detonation
5	2017 (pARCH)	Torpedo	547898.10	6232137.20	N/A	N/A	40m	5KG	25	Sandy	08/05/2020	Detonation achieved – however not High Order and debris recovered to deck.

Sequence	UXO Identification	Description	WGS84 (UTM 30)		Soft-Start	Net Explosive Quantity (NEQ)	Depth	Charge weight	ADD (MINS)	Seabed Condition	Date of Detonation	Clearance Method
			EASTING (m)	NORTHING (m)								
6	E_MAG_0690	2.5" rocket	546636.30	6233248.84	N/A	1.1KG	51m	2.5KG	22	Sandy/Silt	09/05/2020	High order detonation
7	E_MAG_0670_A	30mm Projectile	546347.40	6232370.60	N/A	Unknown (0.25KG)	50m	2.5KG	28	Sandy/Silt	14/05/2020	High order detonation
8	E_MAG_0587	8" Projectile	545718.00	6231768.00	N/A	10KG	45m	5KG	28	Sand/Silt/Shell	15/05/2020	High order detonation
9	E_MAG_0029_A	4" Projectile	543678.60	6232294.50	N/A	15KG	51m	2.5KG	28	Sandy/Silt	15/05/2020	High order detonation
10	E_MAG_0808	8" Projectile	543645.99	6232281.01	N/A	10KG	46m	5KG	28	Sandy/Mud	16/05/2020	Recovered to deck
11	E_MAG_0035_B	20mm AA round	543820.60	6233429.50	N/A	N/A (0.1)	51m	2.5KG	28	Sand/Rocks	17/05/2020	High order detonation
12	G_MAG_0018	15" Projectile	542837.02	6233435.88	N/A	48.3KG	49m	5KG	28	Rock and Mud	17/05/2020	Wet stored
13	G_MAG_0309	7.5 inch Solid Shot	542781.09	6233789.49	N/A	48.3KG	52m	5KG	28	Mud and Silt	18/05/2020	Recovered to deck
14	ECR_O_MAG_0332_A	16" inch Projectile	542899.50	6231646.40	50g 100g	70KG	48m	5KG	38	Sand/Silt/Shell	18/05/2020	Wet stored

Sequence	UXO Identification	Description	WGS84 (UTM 30)		Soft-Start	Net Explosive Quantity (NEQ)	Depth	Charge weight	ADD (MINS)	Seabed Condition	Date of Detonation	Clearance Method
			EASTING (m)	NORTHING (m)								
15	E_MAG_0299	12" inch Solid Shot	544714.70	6230818.70	50g 100g 150g	102KG	50m	5KG	35	Sand Sediment	20/05/2020	Recovered to deck
16	E_MAG_0683	15" Projectile	546555.50	6232420.40	50g 100g 150g	102KG	53m	5KG	35	Sand/Silt	20/05/2020	Wet stored
17	D_MAG_0225	15" Projectile	549824.50	6233244.90	50g 100g 150g	102KG	48m	5KG	38	Sand/Shale	21/05/2020	Recovered to deck
18	C_MAG_0078	15" Projectile	546467.77	6235971.30	50g 100g 150g	102KG	49m	5KG	32	Soft Sand	25/05/2020	Recovered to deck
19	B_MAG_0152	15" Projectile	545760.55	6237588.51	50g 100g 150g	102KG	52m	5KG	32	Soft Mud/Silt	25/05/2020	Recovered to deck
20	G_MAG_0109	10" projectile	541955.70	6234881.00	50g 100g 150g	102KG	54m	5KG	33	Sand/Mud	26/05/2020	Wet stored
21	G_MAG_0067	15" projectile	542912.30	6233574.90	50g 100g 150g	102KG	49m	5KG	33	Sand, Mud, Rocks	26/05/2020	Recovered to deck

Sequence	UXO Identification	Description	WGS84 (UTM 30)		Soft-Start	Net Explosive Quantity (NEQ)	Depth	Charge weight	ADD (MINS)	Seabed Condition	Date of Detonation	Clearance Method
			EASTING (m)	NORTHING (m)								
22	G_MAG_0065	15" projectile	542964.20	6233561.90	50g 100g 150g	102KG	47m	5KG	32	Mud, Rocks	27/05/2020	Recovered to deck
23	G_MAG_0051	15" projectile	542960.70	6233507.40	50g 100g 150g	102KG	46m	5KG	32	Boulder, Clay and Rock	27/05/2020	Recovered to deck
24	G_MAG_0029	15" projectile	542889.13	6233454.52	50g 100g 150g	102KG	48m	5KG	33	Mud and Rock	28/05/2020	Wet stored
25	G_MAG_0010	15" projectile	542856.70	6233407.10	50g 100g 150g	102KG	49m	5KG	33	Rock, Mud and Clay	28/05/2020	Wet stored
26	E_MAG_0068	15" projectile	544013.66	6234094.13	50g 100g 150g	102KG	50m	5KG	32	Sand/Mud	29/05/2020	Wet stored
27	E_MAG_0076	15" projectile	544031.40	6234009.40	50g 100g 150g	102KG	49m	5KG	32	Sand/Mud	31/05/2020	Recovered to deck
28	E_MAG_0070	15" projectile	544010.50	6233959.50	50g 100g 150g	102KG	49m	5KG	32	Sand/Mud	01/06/2020	Wet stored

Sequence	UXO Identification	Description	WGS84 (UTM 30)		Soft-Start	Net Explosive Quantity (NEQ)	Depth	Charge weight	ADD (MINS)	Seabed Condition	Date of Detonation	Clearance Method
			EASTING (m)	NORTHING (m)								
29	E_MAG_0227	15" projectile	544331.68	6233669.52	50g 100g 150g	102KG	47m	5KG	32	Sand/Mud	02/06/2020	Wet stored
30	E_MAG_0036	15" projectile	543815.95	6233387.84	50g 100g 150g	102KG	50m	5KG	32	Sand/Silt/Hard Clay	02/06/2020	Wet stored
31	E_MAG_0008	15" projectile	543476.30	6232598.10	50g 100g 150g	102KG	48m	5KG	33	Sand/Mud	09/06/2020	Wet stored
32	E_MAG_0012_A	15" projectile	543497.30	6232518.49	50g 100g 150g	102KG	48m	5KG	33	Sand/Silt	10/06/2020	Recovered to deck
33	E_MAG_0018	15" projectile	543579.00	6232500.10	50g 100g 150g	102KG	47m	5KG	33	Sand/Mad	16/06/2020	Recovered to deck
34	ECR_O_MAG_0081	8" projectile	542272.70	6227349.50	N/A	10KG	55m	5KG	18	Sand/Silt	17/06/2020	Recovered to deck
35	E_MAG_0017	15" projectile	543568.92	6232481.05	50g 100g 150g	102KG	51m	5KG	33	Sand/Silt	18/06/2020	Recovered to deck

Sequence	UXO Identification	Description	WGS84 (UTM 30)		Soft-Start	Net Explosive Quantity (NEQ)	Depth	Charge weight	ADD (MINS)	Seabed Condition	Date of Detonation	Clearance Method
			EASTING (m)	NORTHING (m)								
36	E_MAG_0021	15" projectile	543582.80	6232471.80	50g 100g 150g	102KG	49m	5KG	33	Sand/Silt	18/06/2020	Recovered to deck
37	ECR_O_MAG_0378	15" projectile	542923.47	6231859.05	50g 100g 150g	102KG	46m	5KG	33	Sand/Silt/Stone	20/06/2020	Wet stored
38	ECR_O_MAG_0362_A	15" projectile	542856.10	6231769.80	50g 100g 150g	102KG	47m	5KG	33	Sand/Silt/Shells	20/06/2020	Wet stored
39	ECR_O_MAG_0036	Paravane	541844.67	6224505.96	N/A	36KG	58m	5KG	16	Sand/Soft Mud	22/06/2020	Recovered to deck
40	ECR_O_MAG_0018	15" projectile	541715.90	6223397.50	50g 100g 150g	102KG	58m	5KG	33	Sand/Light Silt	23/06/2020	Recovered to deck
41	ECR_M_MAG_0708	12" RML Projectile	540160.90	6211354.52	50g 100g 150g	60KG	51m	5KG	33	Sand/Mud	23/06/2020	Partial deflagration achieved. Shell case and nose were recovered to deck, base plate was wet stored.

Sequence	UXO Identification	Description	WGS84 (UTM 30)		Soft-Start	Net Explosive Quantity (NEQ)	Depth	Charge weight	ADD (MINS)	Seabed Condition	Date of Detonation	Clearance Method
			EASTING (m)	NORTHING (m)								
42	B_MAG_0023	6" projectile	547836.80	6236264.80	N/A	6.5KG	48m	5KG	18	Mud/Silt	24/06/2020	Detonation achieved however not High Order. Target fragmented and two pieces were recovered to deck
43	B_MAG_0200	Air Dropped Weapon	544797.28	6239149.29	N/A	15KG	49m	5KG	33	Sand/Mud	24/06/2020	Wet stored
44	B_MAG_0244	15" projectile	544268.68	6240116.54	50g 100g 150g	102KG	51m	5KG	15	Mud/Clay/Shell	25/06/2020	Recovered to deck
45	B_MAG_0245_E	100lb ASW (Anti-Submarine Warfare)	544075.50	6240131.60	N/A	22KG	50m	2.5KG	16	Mud/Silt/Shell	27/06/2020 30/06/2020	High order detonation
46	B_MAG_0245_D	100lb ASW	544078.30	6240130.30	N/A	22KG	50m	2.5KG	16	Mud/Silt/Shell	30/06/2020	High order detonation
47	VO6_MAG_0012 A	Buoyant mine	545058.90	6241424.90	50g 100g 150g	227KG	49m	5KG	22	Sand	04/07/2020	Detonation achieved, unclear

Sequence	UXO Identification	Description	WGS84 (UTM 30)		Soft-Start	Net Explosive Quantity (NEQ)	Depth	Charge weight	ADD (MINS)	Seabed Condition	Date of Detonation	Clearance Method
			EASTING (m)	NORTHING (m)								
												whether high-ordered. Remaining debris recovered to deck.
48	B_MAG_0246_A	100lb ASW	544084.90	6240132.90	N/A	22KG	50m	2.5KG	18	Sand/Mud	06/07/2020	High order detonation
49	B_MAG_0246_B	100lb ASW	544084.90	6240132.10	N/A	22KG	50m	2.5KG	18	Sand/Mud	06/07/2020	High order detonation
50	B_MAG_0245_B	100lb ASW	544077.00	6240139.00	N/A	22KG	50m	2.5KG	18	Mud/Silt/Shell	06/07/2020	High order detonation
51	B_MAG_0245_C	100lb ASW	544080.50	6240131.70	N/A	22KG	50m	2.5KG	18	Mud/Clay/Silt	06/07/2020	High order detonation
52	B_MAG_0246_C	100lb ASW	544083.90	6240132.00	N/A	22KG	50m	2.5KG	18	Sand/Mud	07/07/2020	High order detonation
53	B_MAG_0245_A	100lb ASW	544079.00	6240140.70	N/A	22KG	50m	2.5KG	18	Sand/Mud	08/07/2020	High order detonation

2.4.1 Wet Storage

30. If it couldn't be determined that the UXO was FFE and therefore safe for recovery, the UXO object was safely lifted a few metres off the seabed and removed to a pre-nominated area where it was returned to the seabed. This process of wet storage was utilised for 16 UXOs where it could not be determined that all explosive material had been detonated. An image of an item which did not high-order after detonation and could not be declared as FFE is shown in Figure 5.



Figure 5 - Relocated item of UXO

31. After being confirmed safe to do so, the UXOs identified for wet storage were relocated by the ROV and/or crane. The new locations of the UXOs are presented in Table 3. The original positions of all UXO that were wet-stored are illustrated above, in Figure 4

32. The post relocation disposal area ranged between 40m and 315m from the identified UXO locations, in order to ensure they would be clear of future construction works.

Table 3 - Wet Storage Items

WET STORED UXOS	COORDINATES (WGS84, DDM)		RELOCATED DISTANCE	DEPTH (MEAN SEAWATER, MSW)
	LATITUDE	LONGITUDE		
G_MAG_0109	56° 15.3990056' N	2° 19.5209612' W	163m	56.9
B_MAG_0200	56° 17.7880734' N	2° 16.8327370' W	315m	49
C_MAG_0070	56° 15.8751494' N	2° 14.9861683' W	59m	50
E_MAG_0068	56° 14.9551619' N	2° 17.4446987' W	80m	51
E_MAG_0070	56° 14.9529625' N	2° 17.4371866' W	99m	50
E_MAG_0227	56° 14.7661398' N	2° 17.0252144' W	63m	52
E_MAG_0036	56° 14.6068711' N	2° 17.6180568' W	41m	49.5
E_MAG_0008	56° 14.1305039' N	2° 18.0110558' W	127m	51.2
ECR_O_MAG_0378	56° 13.7835502' N	2° 18.6710479' W	220m	49
ECR_O_MAG_0362A	56° 13.7388159' N	2° 18.6845286' W	164m	46.8

WET STORED UXOS	COORDINATES (WGS84, DDM)		RELOCATED DISTANCE	DEPTH (MEAN SEAWATER, MSW)
	LATITUDE	LONGITUDE		
ECR_O_MAG_0332A	56° 13.6772323' N	2° 18.6810556' W	205m	48
E_MAG_0683	56° 14.1541161' N	2° 14.8862633' W	177m	48
ECR_M_MAG_0708	56° 2.7396026' N	2° 21.2075440' W	116m	51
G_MAG_0018	56° 14.5685232' N	2° 18.6173707' W	149m	49
G-MAG-0010	56° 14.7601876' N	2° 18.4737851' W	270m	50
G-MAG-0029	56° 14.7520912' N	2° 18.47199947' W	206m	50

33. Any relocation of UXO items was conducted as per Condition 3.3.2 of the Marine Licence, which states *“If any UXO is relocated and not cleared by detonation, the licensee must notify the Licensing Authority and the UK Hydrographic Office (“UKHO”) of the new position of the UXO. If any UXO is relocated and not cleared by detonation, the licensee must issue local notification to marine users, fisherman’s organisations, neighbouring port authorities and any other local marine stakeholders, to ensure they are made fully aware of the new position of the UXO.”*

34. An accurate position was recorded for the new location of each item and Notices to Mariners were issued.

2.4.2 Recovery to Deck

35. If the ROV visual inspection confirmed that the UXO was FFE then the item was clear to be returned to the deck of the *Glomar Wave* using the ROV to be disposed of appropriately. Of the 53 UXO items, a total of 20 items were retrieved from the seabed, where high order detonation had not resulted in clearance of all material.

36. An image of an item which did not high-order after detonation but could be declared as safe to recover to deck is shown in Figure 6 - Item declared FFE and recovered to the *Glomar Wave*.



Figure 6 - Item declared FFE and recovered to the *Glomar Wave*

3 Marine Wildlife Interactions

3.1 Post Detonation Search

37. Pursuant to Condition 3.4.2 under Marine Licence 07103/20/1, a post-detonation search was completed after each detonation to identify whether there were injured or dead fish or marine mammals. Any presence of dead or injured marine wildlife as a result of the licenced activities were required to be documented and reported to MS-LOT within 24 hours of the sighting. Throughout the duration of the UXO clearance campaign, dead fish were identified after eight scheduled UXO detonations. The first fish sighting was notified to MS-LOT within 24 hours, however, the subsequent sightings were reported to MS-LOT on the 8th October 2020, as they had not been reported to NnGOWL until this time. The following information was communicated via email.

3.1.1 Fish Report #1

38. At 1500h Coordinated Universal Time (UTC) on Tuesday 2nd June 2020, the detonation of UXO target E_MAG_0036 was carried out at position 56°14.36'N, 02°17.35'W. The item was a 15-inch projectile (102kg NEQ). The detonation was preceded by 32 minutes of ADD usage and three soft start charges, as outlined in Part 5 of the Marine Licence. At 1500h UTC, the post detonation search commenced. The MMO carried out a search of the mitigation zone, as detailed in the Marine Mammal Mitigation Plan (MMMP) (as updated), for over 15 minutes.
39. At 1504h UTC a number of fish were observed floating on the surface of the water, both directly above the detonation site and at a distance of 50m from the location; where a number of birds (mostly Gulls) were seen feeding. A total of between 30-40 birds were seen (Figure 7).
40. Between 1504h and 1520h, three fish from the location above the site of the detonation and three fish 50m distance of the site, were collected for identification and measurements by the MMO. By 1520h UTC, the feeding had abated and the RHIB was hoisted back onto the *Glomar Wave*.
41. The species were identified as Atlantic herring, *Clupea harengus*. The average lengths measured both mouth to fork, and mouth to tail were 17cm and 19cm respectively (Figure 8).
42. Following analysis of the UXO campaign reporting, it is confirmed that item E_MAG_0036 didn't undergo a high order detonation and was subsequently wet stored. Therefore, it is anticipated that only the donor charge was detonated at this location.



Figure 7 - Retrieved Atlantic Herring



Figure 8 - Fish Retrieval

3.1.2 Fish Report #2

43. At 1500h UTC on Tuesday 16th June 2020, UXO target E_MAG_0018 was detonated at position 56°14.12'N, 002°17.82'W. The item was a 15-inch projectile (102kg NEQ). The detonation was preceded by 33 minutes of ADD usage and three soft start charges. A post detonation search within the mitigation zone was commenced by the MMO at 1500h for 15 minutes.
44. At 1504h, a single fish was observed floating at the surface. The fish was retrieved for measurements and identification by the MMO. By 1535h, the RHIB had returned to the *Glomar Wave*.
45. The retrieved fish was a suspected juvenile Haddock, *Melanogrammus aeglefinus*. The lengths measured both mouth to fork, and mouth to tail were 4.1cm and 4.2cm respectively (Figure 9).
46. It has been confirmed that item E_MAG_0018 didn't undergo a high order detonation and was subsequently recovered to deck. Therefore, it is anticipated that only the donor charge was detonated at this location.



Figure 9 - Suspected juvenile Haddock retrieved

3.1.3 Fish Report #3

47. At 1000 UTC on Thursday 18th June 2020, UXO target E_MAG_0017 was detonated at position 56°14.113'N, 002°17.828'W. The item was a 15-inch projectile (102kg NEQ). The detonation was preceded by 33 minutes of ADD usage and three soft start charges. A post detonation search within the mitigation zone was commenced by the MMO at 1000h.
48. At 1006h, a dead juvenile fish was observed at the waters surface at the detonation site. The fish was retrieved for measurements and identification by the MMO. By 1025h, the sightings were reported when the RHIB had returned to the *Glomar Wave*.
49. The retrieved fish species was identified as Haddock, *Melanogrammus aeglefinus*. The lengths measured both mouth to fork, and mouth to tail were 6.3cm and 6.5cm respectively (Figure 10).
50. It has been confirmed that item E_MAG_0017 didn't undergo a high order detonation and was subsequently recovered to deck. Therefore, it is anticipated that only the donor charge was detonated at this location.



Figure 10 - Retrieved Haddock

3.1.4 Fish Report #4

51. At 0900 UTC on Tuesday 23rd June 2020, UXO target ECR_MAG_0018 was detonated at position 56°06.227'N, 002°19.707'W. The item was a 15-inch projectile (102kg NEQ). The detonation was preceded by 33 minutes of ADD usage and three soft start charges. A post detonation search within the mitigation zone was commenced by the MMO at 0900UTC.
52. Between 0911-0917h, two dead juvenile fish were observed four minutes apart on the surface at the detonation site. Both fish were retrieved for measurements and identification by the MMO. At 0925, the RHIB had returned to the *Glomar Wave*.
53. Both fish retrieved were suspected juvenile Whiting, *Merlangius merlangus*. The lengths measured both mouth to fork and mouth to tail were 4.6cm and 4.8cm respectively (Figure 11) and 3.3cm and 3.7cm respectively (Figure 12).
54. It has been confirmed that item ECR_MAG_0018 didn't undergo a high order detonation and was subsequently recovered to deck. Therefore, it is anticipated that only the donor charge was detonated at this location.



Figure 11 - Suspected juvenile Whiting retrieved



Figure 12 - Suspected juvenile Whiting retrieved

3.1.5 Fish Report #5

55. At 0900 UTC on Wednesday 24th June 2020, UXO target B_MAG_0023 was detonated at location 56°16.129'N, 002°13.657'W. The item was a 6-inch projectile (6.5kg NEQ). The detonation was preceded by 18 minutes of ADD usage and had no soft start charges implemented. A post detonation search within the mitigation zone was commenced by the MMO at 0900h.
56. At 0914h, one dead juvenile fish was observed at the waters surface. The fish was retrieved for measurements and identification by the MMO and returned to the *Glomar Wave* at 0925.
57. The retrieved fish was a suspected juvenile Whiting, *Merlangius merlangus*. The length measured mouth to tail was 4.4cm (Figure 13).
58. It has been confirmed that item B_MAG_0023 underwent a high order detonation.



Figure 13 - Suspected juvenile Whiting retrieved

3.1.6 Fish Report #6

59. At 1400 UTC on Thursday 25th June 2020, UXO target B_MAG_0244 was detonated at location 56°18.239'N, 002°17.258'W. The item was a 15-inch projectile (102kg NEQ). The detonation was preceded by 15 minutes of ADD usage and three soft start charges. A post detonation search within the mitigation zone was commenced by the MMO at 1400h.
60. At 1413h, one dead fish was observed at the waters surface. The fish was retrieved for measurements and identification by the MMO and returned to the *Glomar Wave* at 1425h.
61. The retrieved fish was identified as Haddock, *Melanogrammus aeglefinus*. The lengths measured both mouth to fork, and mouth to tail were 13.6cm and 14.5cm respectively (Figure 14).
62. It has confirmed that item B_MAG_0244 didn't undergo a high order detonation and was subsequently recovered to deck. Therefore, it is anticipated that only the donor charge was detonated at this location.



Figure 14 - Retrieved Haddock

3.1.7 Fish Report #7

63. At 1400 UTC on Tuesday 30th June 2020, UXO target B_MAG_0245_D was detonated at location 56°18.254'N, 002°17.387'W. The item was a 100lb ASW (22kg NEQ). The detonation was preceded by 16 minutes of ADD usage and had no soft start charges implemented. A post detonation search within the mitigation zone was commenced by the MMO at 1400h.
64. Between 1410-1420h, a variety of bird species were observed feeding around the detonation site. These were 10-20 Gannet *Morus bassanus*, 20-30 Puffin *Fratercula arctica* and 5-10 Herring gull *Larus argentatus*.
65. At 1411h, one dead fish was observed at the water's surface. The fish was retrieved for measurements and identification by the MMO and returned to the *Glomar Wave* at 1425h.
66. The retrieved fish was identified as Mackerel, *Scomber scombrus*. The length measured mouth to tail was 17.5cm (Figure 15).
67. It has been confirmed that item B_MAG_0245_D underwent a high order detonation.



Figure 15 - Retrieved Mackerel

3.1.8 Fish Report #8

68. At 1500 UTC on Wednesday 8th July 2020, UXO target B_MAG_0245_A was detonated at location 56°18.202'N, 002°17.167'W. The item was a 100lb ASW (22kg NEQ). The detonation was preceded by 18 minutes of ADD usage and had no soft start charges implemented. A post detonation search within the mitigation zone was commenced by the MMO at 1500h.

69. At 1510h, one dead fish was observed at the water's surface. The fish was retrieved for measurements and identification by the MMO and returned to the *Glomar Wave* at 1525h.
70. The retrieved fish was a suspected juvenile Atlantic Cod, *Gadus morhua*. The length measured mouth to tail was 6cm (Figure 16).
71. It has been confirmed that item B_MAG_0245_A underwent a high order detonation.



Figure 16 - Suspected juvenile Atlantic Cod retrieved

3.2 Summary of Marine Mammal Sightings

72. A summary of the marine mammal sightings is presented in Table 4.

Table 4 - Marine Mammal Sightings

SIGHTING NUMBER	DATE	TIME SEEN	SPECIES OR GROUP	COMMON NAME	NUMBER OF INDIVIDUALS	BEHAVIOUR	RANGE (M)	OPERATIONAL ACTIVITY	MITIGATION
1	05/05/2020	07:10	<i>B. acutorostrata</i>	Minke whale	5	Travelling	3,000	Inactive	None
2	05/05/2020	07:24	<i>Megaptera novaengliae</i>	Humpback whale	1	Foraging	3,500	Inactive	None
3	05/05/2020	07:26	<i>Orcinus orca</i>	Killer whale	1	Surfacing	6,000	Inactive	None
4	07/05/2020	11:15	<i>B. acutorostrata</i>	Minke whale	1	Surfacing	10	Inactive	None
5	07/05/2020	11:29	<i>B. acutorostrata</i>	Minke whale	1	Surfacing	2,500	Inactive	None
6	19/05/2020	04:55	<i>B. acutorostrata</i>	Minke whale	1	Surfacing	300	Inactive	None
7	19/05/2020	08:41	<i>Balaenoptera sp.</i>	Rorqual sp.	1	Surfacing	3,000	Inactive	None
8	19/05/2020	08:55	<i>B. acutorostrata</i>	Minke whale	1	Surfacing	200	Inactive	None
9	19/05/2020	08:57	<i>Tursiops truncatus</i>	Bottlenose dolphin	3	Feeding	900	Inactive	None
10	19/05/2020	09:07	<i>B. acutorostrata</i>	Minke whale	1	Surfacing	1,00	Inactive	None

SIGHTING NUMBER	DATE	TIME SEEN	SPECIES OR GROUP	COMMON NAME	NUMBER OF INDIVIDUALS	BEHAVIOUR	RANGE (M)	OPERATIONAL ACTIVIITY	MITIGATION
11	20/05/2020	03:50	<i>Phocoena phocoena</i>	Harbour porpoise	2	Surfacing	500	Inactive	None
12	23/05/2020	06:50	<i>H. grypus</i>	Grey seal	1	Surfacing	5	Inactive	None
13	23/05/2020	08:00	<i>Phocoena phocoena</i>	Harbour porpoise	3	Surfacing	300	Inactive	None
14	24/05/2020	05:30	<i>Tursiops truncatus</i>	Bottlenose dolphin	8	Surfacing	10	Inactive	None
15	01/06/2020	07:20	<i>B. acutorostrata</i>	Minke whale	1	Surfacing	100	Inactive	None
16	06/06/2020	08:49	<i>H. grypus</i>	Grey seal	1	Surfacing	10	Inactive	None
17	08/06/2020	08:00	<i>H. grypus</i>	Grey seal	1	Surfacing	10	Inactive	None
18	13/06/2020	10:03	<i>Lontra europaea</i>	Eurasian otter	1	Surfacing	10	Inactive	None
19	16/06/2020	08:45	<i>H. grypus</i>	Grey seal	1	Surfacing	40	Inactive	None
20	17/06/2020	05:55	<i>H. grypus</i>	Grey seal	1	Surfacing	10	Inactive	None
21	27/06/2020	13:01	<i>H. grypus</i>	Grey seal	1	Foraging	0	Inactive	None

SIGHTING NUMBER	DATE	TIME SEEN	SPECIES OR GROUP	COMMON NAME	NUMBER OF INDIVIDUALS	BEHAVIOUR	RANGE (M)	OPERATIONAL ACTIVITIY	MITIGATION
22	28/06/2020	23:00	<i>H. grypus</i>	Grey seal	1	Surfacing	20	Inactive	None
23	30/06/2020	08:12	<i>H. grypus</i>	Grey seal	-	-	-	Inactive	None

4 Conclusion

73. The UXO inspection campaign identified 53 UXOs across the wind farm site and export cable corridor. The UXO clearance campaign commenced on the 3rd May 2020 and the last detonation was undertaken on the 8th July 2020, with the campaign declared complete on 11th July 2020. The UXO clearance campaign was completed in 67 days.
74. The original Marine Licence (07103/20/0) was granted based on a total of 50 UXO requiring clearance. As a result, a Marine Licence variation was requested on the 19th May 2020 following the identification of additional UXO above the consented allowance. Marine Licence 07103/20/1 was granted on 16th June 2020.
75. Condition 3.5.3 attached to the Marine Licence (ML) requires the submission of a post-detonation report by NnGOWL, detailing actions taken in response to the terms and conditions of the licence, to MS-LOT no later than 28 days following the completion of the licenced activities. This report has been prepared in response to that condition and will be submitted to MS-LOT in advance of 8th August 2020.
76. A total of 52 detonations took place, with two items detonating with one donor charge on one occasion. The majority of the identified UXOs were cleared by high order detonation (14 items) or the item declared free from explosives and retrieved to the deck of the *Glomar Wave* for onshore disposal as debris (20 items). A smaller quantity of UXOs were wet stored (14 items). Additionally, five underwent a detonation which was not confirmed to be of high-order or was a partial deflagration, and debris remained, requiring wet-storage or retrieval to deck. Of these, two required partial wet-storage due to potential explosive material remaining and partial retrieval to deck, whilst two were declared safe to be retrieved to deck and one had two fragmented pieces recovered to deck. The post-clearance debris retrieval was completed at all locations where possible.
77. The marine mammal mitigation procedure was implemented across all licensed activities. Marine mammal monitoring and mitigation measures were positive in removing the occurrence of any negative interactions with marine mammals. Over the 53 detonations that occurred, the post-detonation search identified eight interactions with marine wildlife. There were eight recorded instances of a small quantity of fish mortality potentially linked to the licensed activities.

Appendix A – Compliance with ML 07103/20/1

ML Condition	NnGOWL Response
3.1 General Conditions	
<p>Condition 3.1.1</p> <p>The Licensee must at all times carry on the Licensed Activities in accordance with the Licence and the Application.</p>	<p>NnGOWL completed the Licensed Activities in accordance with this Licence, demonstrated in the subsequent rows of this table.</p>
<p>Condition 3.1.2</p> <p>The Licensee must provide, as soon as reasonably practicable in advance of their engagement in the Licensed Activities authorised under this licence, the name and function of any vessel, vehicle, agent, contractor or sub-contractor appointed to engage in the Licensed Activities to the Licensing Authority. Where applicable the notification must include the vessel type, vessel IMO number and vessel owner or operating company.</p>	<p>NnGOWL submitted to the Licensing Authority the details of all vessels deployed to complete the licensed activities via a Notice to Mariners issued on 10/04/2020.</p>
<p>The Licensee must ensure that any changes to the supplied details must be notified to the Licensing Authority, in writing as soon as reasonably practicable, prior to any vessel, vehicle, agent, contractor or sub-contractor engaging in the Licensed Activities.</p>	<p>There were no changes to the initially supplied details prior to any contractor completing the licensed activities.</p>
<p>The Licensee must ensure that only those vessels, vehicles, operators, agents, contractors or sub-contractors notified to the Licensing Authority are permitted to carry out any part of the Licensed Activities.</p>	<p>NnGOWL only contracted vessels to complete the Licensed Activities that had been notified to and confirmed for works from the Licensing authority.</p>
<p>The name and address of any agents, contractors or sub-contractors appointed to carry out any part, or all, of the Licensed Activities must be notified to the Licensing Authority prior to their engagement in the Licensed Activities.</p>	<p>NnGOWL submitted to the Licensing Authority the details of the Contractor undertaking these works via the Notice to Mariners.</p>
<p>The Licensee must satisfy themselves that any masters of vessels or vehicle operators, agents, contractors or sub-contractors are aware of the extent of the Licensed Activities for which this licence has been granted, the activity which is licensed and the terms of the conditions attached to this licence. All masters of vessels or vehicle operators, agents, contractors and sub-contractors permitted to engage in the Licensed Activities must abide by the conditions set out in this licence.</p>	<p>NnGOWL ensured that all contractors completing the licensed works were made aware and adhered to the conditions of this licence. Client representatives and daily vessel calls ensured compliance with this condition.</p>
<p>The Licensee must ensure that any vessels permitted to engage in the Licensed Activities are marked in accordance with the International Rules for the Prevention of Collisions at Sea whilst under way, and in accordance with the UK Standard Marking Schedule for Offshore Installations if the vessel is secured to the seabed.</p>	<p>NnGOWL ensured that all vessels used during the UXO clearance campaign were marked to the requirements of this condition.</p>

ML Condition	NnGOWL Response
<p>The Licensee must give a copy of this licence, and any subsequent variations made to this licence in accordance with section 30 of the 2010 Act, to the masters of any vessels, vehicle operators, agents, contractors or sub-contractors permitted to engage in the Licensed Activities and must ensure that the licence and any such variations are read and understood by those persons.</p>	<p>NnGOWL ensured that the conditions of this licence were distributed to all contractors participating in the UXO clearance campaign. Engagement and confirmation of the understanding of the conditions by NnGOWL from the contractors was ensured before licensed activities commenced.</p>
<p>Condition 3.1.3</p> <p>Should the Licensee or any of their agents, contractors or sub-contractors, by any reason of force majeure deposit anywhere in the marine environment any substance or object, then the Licensee must notify the Licensing Authority of the full details of the circumstances of the deposit within 48 hours of the incident occurring (failing which as soon as reasonably practicable after that period of 48 hours has elapsed). Force majeure may be deemed to apply when, due to stress of weather or any other cause, the master of a vessel or vehicle operator determines that it is necessary to deposit the substance or object other than at the Site because the safety of human life or, as the case may be, the vessel, vehicle or marine structure is threatened. Under Annex II, Article 7 of the Convention for the Protection of the Marine Environment of the North-east Atlantic, the Licensing Authority is obliged to immediately report force majeure incidents to the Convention Commission.</p>	<p>There were no incidences where the contractors completing the licensed activities were required under force majeure to deposit any substances or objects on the seabed.</p>
<p>Condition 3.1.4</p> <p>The Licensee must, where any information upon which the granting of this licence was based has after the granting of the licence altered in any material respect, notify the Licensing Authority of this fact, in writing, as soon as is practicable.</p>	<p>NnGOWL submitted a Marine Licence variation request on the 19/05/2020 following the identification of additional UXO above the consented allowance.</p>
<p>Condition 3.1.5</p> <p>The Licensee must submit all reports and notifications to the Licensing Authority, in writing, as are required under this licence within the time periods specified in this licence.</p> <p>The reports must include executive summaries, assessments and conclusions and any data will, subject to any rules permitting non-disclosure, be made publicly available by the Licensing Authority or by any such party appointed at their discretion.</p> <p>Reports prepared pursuant to another consent or licence relating to the Licensed Activities by the Licensee or by a third party may also be used to satisfy the requirements of this licence.</p>	<p>NnGOWL submitted all reports associated with this licence to the requirements of this condition.</p>

ML Condition	NnGOWL Response
<p>Reports will include but not be limited to, the noise registry, MMO records and requirements of monitoring as detailed in condition 3.5.3, 3.5.4 and 3.5.5.</p>	
<p>Condition 3.1.6</p> <p>The Licensee must ensure that all reasonable, appropriate and practicable steps are taken at all times to avoid or minimise any damage to the Scottish marine area caused as a result of the undertaking of the licensed activities.</p>	<p>NnGOWL utilised the smallest charge size required for the nature and size of each UXO. If the item did not detonation on the first attempt then a decision was made whether to wet-store or recovery for disposal, rather than subsequent attempts and additional uses of charges.</p>
<p>The Licensee must ensure that all personnel adhere to the Scottish Marine Wildlife Watching Code (www.marinecode.org) where appropriate while carrying on the Licensed Activities authorised under this licence.</p>	<p>NnGOWL ensured that all contractors completing the licensed works were made aware and adhered to the Scottish Marine Wildlife Watching Code</p>
<p>The Licensee must ensure that any debris or waste material placed below MHWS during the construction of the Licensed Activities is removed from the Site.</p>	<p>All charge items utilised in the detonation of UXO items were recovered following use.</p>
<p>The Licensee must ensure appropriate steps are taken to minimise damage to the foreshore and seabed by the Licensed Activities.</p>	<p>NnGOWL utilised the smallest charge size required for the nature and size of each UXO, this minimises the impact on the seabed.</p>
<p>The Licensee must ensure the best method of practice is used to minimise re-suspension of sediment during these Licensed Activities.</p>	<p>NnGOWL utilised the smallest charge size required for the nature and size of each UXO, this minimises the impact on the seabed.</p>
<p>The Licensee must ensure that the risk of transferring marine non-native species to and from the Site is kept to a minimum by ensuring appropriate bio-fouling management practices are implemented during the Licensed Activities.</p>	<p>NnGOWL ensured that all contractors completing the licensed works were made aware of this condition and implement bio-fouling management practices.</p>
<p>Condition 3.1.7</p> <p>The Licensee must ensure that copies of this licence and any subsequent amendments or variations are available for inspection at any reasonable time by any authorised by the Licensing Authority at:</p> <ul style="list-style-type: none"> a) the premises of the Licensee; b) the premises of any agent, contractor or sub-contractor acting on behalf of the Licensee; c) any onshore premises directly associated with the Licensed Activities; and d) aboard any vessels permitted to engage in the Licensed Activities. 	<p>NnGOWL ensured that copies of this licence were made available throughout the duration of the works to the required locations of this condition.</p>
<p>Condition 3.1.8</p> <p>Any persons authorised by the Licensing Authority, must be permitted to inspect the Licensed Activities at any reasonable time. The Licensee must, as far as reasonably practicable, on</p>	<p>This was not required throughout the duration of the Licensed Activities.</p>

ML Condition	NnGOWL Response
<p>being given reasonable notice by the Licensing Authority (of at least 72 hours), provide transportation to and from the Site for any persons authorised by the Licensing Authority to inspect the Site/Licensed Activities.</p>	
<p>Condition 3.1.9</p> <p>If the assistance of a Government Department (to include departments of Administrations other than the Scottish Government) is required to deal with any emergency arising from:</p> <ul style="list-style-type: none"> a) the failure to mark and light the Licensed Activities as required by this licence; b) the maintenance of the Licensed Activities; or c) the drifting or wreck of the Licensed Activities, <p>to include the broadcast of navigational warnings, then the Licensee is liable for any expenses incurred in securing such assistance.</p>	<p>This was not required throughout the duration of the Licensed Activities.</p>
<p>3.2 Conditions applicable to all phases of the Licenced Activities</p>	
<p>Condition 3.2.1</p> <p>The Licensee must, where possible, avoid the detonation of UXO greater than 100kg, during the period of 3 May to 18 May.</p>	<p>The detonation of UXO greater than 100kg was completed outside the period of 3-18th May. A detailed summary for each detonation is provided in Table 2.</p>
<p>Condition 3.2.2</p> <p>In the event of any breach of health and safety or environmental obligations relating to the Licensed Activities during the period of this licence, the Licensee must provide written notification of the nature and timing of the incident to the Licensing Authority, including confirmation of remedial measures taken or to be taken to rectify the breach, within 24 hours of the incident occurring.</p>	<p>There were no breaches of health and safety or environmental obligations throughout the duration of the Licensed Activities.</p>
<p>Condition 3.2.3</p> <p>The Licensee must ensure suitable bunding and storage facilities are employed to prevent the release of fuel oils and lubricating fluids associated with the plant and equipment into the marine environment.</p>	<p>All contracted vessels carrying out the licensed activities were equipped with suitable bunding and storage facilities.</p>
<p>Condition 3.2.4</p> <p>The Licensee must ensure that the Licensed Activities are carried out in accordance with the Marine Mammal Mitigation Plan (“MMMP”) (NNG-GOB-ECF-REP-0002), as updated within the Explanatory Note (NNG-PEL-ECF-MEM-0001) and subject to any modifications or amendments made within this licence.</p>	<p>All Licensed Activities were carried out in accordance with the “MMMP” as shown in Unexploded Ordnance Clearance Method.</p>

ML Condition	NnGOWL Response
<p>Mitigation measures must be carried out in accordance with the Summary of Approved UXO Mitigation Measures, shown in Part 5, Figure 2 of this licence.</p> <p>In the event the Licensee wishes to update or amend any of the protocols in the MMMP (as updated), the Licensee must submit details of proposed updates or amendments to the Licensing Authority in writing for its written approval no later than 28 days, or at such a time as agreed with the Licensing Authority, prior to the planned implementation of the proposed updates or amendments.</p> <p>No Licensed Activities associated with the proposed updates or amendments may proceed prior to the granting of such approvals.</p>	
<p>Condition 3.2.5</p> <p>The Licensee must appoint a Fisheries Liaison Officer (“FLO”), to maintain effective, continual communication between any contractors or sub-contractors, fishermen and other users of the sea during the Licensed Activities and which will ensure compliance with best practice guidelines when doing so.</p>	<p>NnGOWL appointed a Fisheries Liaison Officer (FLO) for the duration of the Licenced Activities.</p>
<p>Condition 3.2.6</p> <p>The Licensee must ensure the Licensed Activities will not occur within Archaeological Exclusion Zones as identified in the approved Marine Archaeological Reporting Protocol (“MARP”) and that any unexpected archaeological features discovered during the Licensed Activities are addressed following the protocol for archaeological discoveries. The MARP must be adhered to at all times during the Licensed Activities for all areas of the Licensed Activities.</p>	<p>NnGOWL issued information regarding the Archaeological Exclusion Zones to the Contractor undertaking the Licensed Activities. There were no Licensed Activities undertaken in these areas.</p>
<p>Condition 3.2.7</p> <p>The Licensee must carry out all monitoring in accordance with the UXO Clearance Noise Monitoring Scope Overview Document (NNG-SMR-ECR-REP-0001) but subject to any modifications or amendments made within this licence. Monitoring must be undertaken at a minimum of 20 confirmed UXO targets, over a range of UXO sizes to maximum size and a range of water depths and substrates.</p>	<p>Noise Monitoring was undertaken between 14th May 2020 and 24th June 2020, with a total of 37 clearances monitored.</p>
<p>The monitoring must collect data to:</p> <ul style="list-style-type: none"> • allow a prediction of the source level of UXO detonations; • characterise the propagation of noise from UXO detonations in the offshore environment; • assess how variations associated with the condition, location, age, type of UXO and 	<p>The monitoring report will be provided within 5 months from completion of the Licensed Activities. They survey has been designed to address all requirements of this condition.</p>

ML Condition	NnGOWL Response
<p>environmental factors relate to noise emissions; and</p> <ul style="list-style-type: none"> enable an examination of any changes in impulsive characteristics of UXO detonation noise with increasing distance from the source. 	
<p>The Licensing Authority and Scottish Natural Heritage (“SNH”) must be informed immediately where the timescales for monitoring are not met and if there is any unforeseen circumstance that may have an impact on the data collection.</p>	<p>There were no issues with the deployment timescales of the UXO noise monitoring equipment.</p>
<p>Should monitoring fail or be unable to continue or take place the Licensee must cease all Licensed Activities immediately and notify the Licensing Authority.</p> <p>No Licensed Activities may continue until alternative monitoring has been proposed to and approved by the Licensing Authority.</p>	<p>There were no issues with the deployment timescales of the UXO noise monitoring equipment.</p>
<p>3.3 Prior to the Commencement of the Licenced Activities</p>	
<p>Condition 3.3.1</p> <p>The Licensee must notify the Licensing Authority of details of any UXO in water depths less than 40m, where bubble curtains could be utilised as mitigation. The Licensee must implement bubble curtains during the use of any explosive substance or article during the detonation of such UXO as agreed with the Licensing Authority following the notification.</p>	<p>There were no UXO found in water depths of less than 40 m.</p>
<p>Condition 3.3.2</p> <p>If any UXO is relocated and not cleared by detonation, the licensee must notify the Licensing Authority and the UK Hydrographic Office (“UKHO”) of the new position of the UXO.</p> <p>If any UXO is relocated and not cleared by detonation, the licensee must issue local notification to marine users, fisherman’s organisations, neighbouring port authorities and any other local marine stakeholders, to ensure they are made fully aware of the new position of the UXO.</p>	<p>All relocated items were notified to the Licensing Authority and the UKHO with the new position and details of the UXO.</p>
<p>Condition 3.3.3</p> <p>The Licensee must, prior to and no less than 24 hours before the Commencement of the Licensed Activities, notify the Licensing Authority, in writing, of the date of Commencement of the Licensed Activities authorised under this Licence.</p>	<p>NnGOWL notified MS-LOT of the date of Commencement of the Licensed Activities to the requirements of Condition 3.3.3.</p>
<p>Condition 3.3.4</p> <p>The Licensee must complete and submit a Proposed Activity Form in the online Marine Noise Registry for all aspects of the Licensed Activities that will produce loud, low to medium frequency (10Hz-10kHz) impulsive noise no later than seven</p>	<p>NnGOWL submitted a Proposed Activity Form in the online Marine Noise Registry for all aspects of the Licensed Activities that will produce loud, low to medium frequency (10Hz-10kHz) impulsive noise at the time of Application. There were no changes proposed.</p>

ML Condition	NnGOWL Response
<p>days prior to Commencement of the Licensed Activities. If any aspects of the Licensed Activities differ from the Proposed Activity Form in the online Marine Noise Registry, the licensee must complete and submit a new Proposed Activity Form Licensed.</p>	
<p>Condition 3.3.5</p> <p>The Licensee must, prior to Commencement of the Licensed Activities, issue local notification to marine users, fisherman’s organisations, neighbouring port authorities and any other local marine stakeholders to ensure they are made fully aware of the Licensed Activities.</p>	<p>NnGOWL submitted local Notice to Mariners to inform about the scheduled UXO clearance campaign. All stakeholders were made aware of the licensed activities prior to commencement.</p>
<p>The Licensee must notify Her Majesty’s Coastguard (“HMCG”) seven days in advance of the Commencement of the Licensed Activities (in this case to renewables@hmcg.gov.uk) and include emergency contact information for the vessel and expected timescale of operation. The Licensee must send a copy of this notification to the Licensing Authority within five days of issue. Verbal communication must be made directly with HMCG prior to the Commencement of the Licensed Activities, either using the appropriate radio channels/frequencies or via telephone, in this case to Zone 04: 01224 592 334.</p>	<p>NnGOWL submitted local Notice to Mariners to inform about the scheduled UXO clearance campaign to HMCG. Regular verbal communication was made directly with HMCG during the Licensed Activities.</p>
<p>The Licensee must ensure that details of the Licensed Activities are promulgated in the Kingfisher Fortnightly Bulletin, prior to the Commencement of the Licensed Activities to inform sea users of the vessel routes, the timings and the location of the Licensed Activities and of the relevant operations.</p>	<p>NnGOWL submitted regular notices in the Kingfisher Fortnightly Bulletin prior to and during the Licensed Activities. Details of vessel routes, operations, timings and locations were covered amongst other information.</p>
<p>3.4 During the Licenced Activities</p>	
<p>Condition 3.4.1</p> <p>The Licensee must notify neighbouring port authorities, local mariners, fishermen's organisations, on a weekly basis of the progress of the Licensed Activities through local Notice to Mariners or any other appropriate means.</p>	<p>NnGOWL submitted weekly Notice to Mariners to the stakeholders listed in Condition 3.4.1.</p>
<p>The Licensee must ensure that progress of the Licensed Activities is promulgated regularly in the Kingfisher Fortnightly Bulletin to inform sea users of the vessel routes, the timings and the location of the Licensed Activities and of the relevant operations.</p>	<p>NnGOWL submitted regular notices to the Kingfisher Bulletin. Details of vessel routes, operations, timings and locations were covered amongst other information.</p>
<p>The Licensee must ensure Radio Navigation Warnings are issued and guard vessels are deployed during the Licensed Activities.</p>	<p>Radio Navigation Warnings were issued throughout the duration of the clearance campaign to all marine traffic within the vicinity of the site. Guard vessels were also deployed during all the licensed activities.</p>

ML Condition	NnGOWL Response
<p>The Licensee must ensure the Site is clear of shipping and recreational vessels prior to any detonation of UXO.</p>	<p>Prior to the detonation of any UXO, a visual and radar search was undertaken to confirm the site is clear of shipping and recreational vessels.</p>
<p>Condition 3.4.2</p> <p>Following each detonation, the Licensee must carry out a post-detonation search of the mitigation zone, as detailed in the MMMP (as updated), for at least 15 minutes. Such searches must focus on any affected, injured or distressed marine mammal and any affected, injured, distressed or dead fish.</p>	<p>Following each detonation, a post-detonation search was completed. The post-detonation search method is detailed in Section 2.3.1 Post-Detonation Sea Surface Search.</p>
<p>The Licensee must stop the Licensed Activities immediately if any marine mammal is visibly affected and report such sighting to the Licensing Authority within 24 hours.</p>	<p>No marine mammals were visibly affected by the Licensed Activities.</p>
<p>The Licensee must recover any dead or injured fish resulting from the Licensed Activities, where safe to do so. The Licensee must examine such recovered fish and document any findings. The Licensee must notify the Licensing Authority of any visibly affected or dead fish within 24 hours of the sighting.</p>	<p>NnGOWL reported eight incidents of dead fish resulting from planned UXO detonations. Following the post-detonation searches, small quantities of fish species were recovered and the findings were documented and reported to MS-LOT. The full report is detailed in Section 3.</p>
<p>3.5 Upon completion of the Licenced Activities</p>	
<p>Condition 3.5.1</p> <p>The Licensee must, no later than 14 days following the Completion of the Licensed Activities, notify the Licensing Authority, in writing, of the date of Completion of the Licensed Activities.</p>	<p>NnGOWL provided written confirmation to MS-LOT within 14 days on the Completion of the Licensed Activities.</p>
<p>Condition 3.5.2</p> <p>The Licensee must ensure that any debris (including any debris from UXO detonation) or waste material, originating during the Licensed Activities is removed from the Site.</p> <p>The Licensee must take all reasonable, appropriate and practicable steps to restore the Site to its original condition, or to as close to its original condition as is reasonably practicable, to the satisfaction of the Licensing Authority.</p>	<p>NnGOWL has removed, where possible, all debris from the site. This procedure is detailed in Debris Removal. Any items relocated to wet-store during the activities have been reported.</p>
<p>Condition 3.5.3</p> <p>The Licensee must submit a report stating the nature and quantity of all objects cleared, removed or disposed of during the Licensed Activities and the date and location of each UXO that has been detonated to the Licensing Authority in writing no later than 28 days following the Completion of the Licensed Activities.</p>	<p>NnGOWL has prepared this report in response to the requirements of condition 3.5.3.</p>

ML Condition	NnGOWL Response
<p>The report must also confirm that all waste/debris from each UXO cleared by detonation has been removed; the method used to remove the debris; and details of the amount and type of explosive substance or article utilised for each UXO detonation.</p>	<p>This report presents a detailed overview of the quantity and description of the UXOs, the detonation method procedure and debris removal. Debris Removal details the amount and type of explosive substance or article utilised for each UXO detonation.</p>
<p>The Licensee must provide the Licensing Authority with the MMO records no later than 28 days following completion of the Licensed Activities, or at any other period, including sooner should the Licensing Authority require.</p>	<p>NnGOWL have provided the Licensing Authority with the MMO records appended to this report, prior to 28 days following the completion of the Licenced Activities.</p>
<p>Condition 3.5.4</p> <p>The Licensee must submit a final Monitoring Report, including any associated raw data, to the Licensing Authority, SNH and Marine Scotland Science no later than five months (or such other period as is agreed in writing by the Licensing Authority) following the Completion of the Licensed Activities.</p> <p>The Monitoring Report must:</p> <ul style="list-style-type: none"> • predict the source level of UXO detonations; • characterise the propagation of noise from UXO detonations in the offshore environment; • assess how variations associated with the condition, location, age, type of UXO and environmental factors relate to noise emissions; • examine any changes in impulsive characteristics of UXO detonation noise with increasing distance from the source; • compare the modelled impact ranges; and • calculate weighted sound exposure level. <p>The Licensee must ensure full details of the recording equipment, deployment configuration, method of detonation and environmental data (sound speed profile of the water column, wind speed, significant wave height, tidal state, precipitation and presence of vessels within 10 km) is reported, alongside each measurement, in the Monitoring Report. Details of each UXO detonation (sequence in detonation, size, type, age, condition, position, burial, depth and donor charge used) must also be included in the Monitoring Report.</p>	<p>The final monitoring report will be issued to the Licensing Authority, SNH and Marine Scotland Science no later than five months following the Completion of the Licensed Activities.</p>
<p>The Licensee must also submit any reports associated with the Department for Business, Energy and Industrial Strategy funded project to the Licensing Authority as soon as reasonably practicable.</p>	<p>NnGOWL will submit any reports associated with the Department for Business, Energy and Industrial Strategy funded project to the Licensing Authority as soon as reasonably practicable.</p>

ML Condition	NnGOWL Response
<p>Condition 3.5.5</p> <p>The Licensee must complete and submit a Close-out Report for all aspects of the Licensed Activities that produced loud, low to medium frequency (10Hz-10kHz) impulsive noise in the online Marine Noise Registry no later than 12 weeks from the Completion of the Licensed Activities.</p>	<p>NnGOWL will complete the ‘close-out’ noise registry form in line with 12-week timeframe.</p>
<p>Condition 3.5.6</p> <p>The Licensee must ensure that neighbouring port authorities, local mariners, fishermen’s organisations are made fully aware of the Completion of the Licensed Activities. Verbal communication must be made direct with HMCG to notify the Completion of the Licensed Activities, either using the appropriate radio channels/frequencies or via telephone in this case to Zone 04: 01224 592 334.</p>	<p>NnGOWL submitted a notice to mariners confirming the Completion of the Licensed activities to local stakeholders. The HMCG were notified verbally on the Completion of the Licensed activities.</p>
<p>The Licensee must ensure that the Completion of the Licensed Activities is promulgated in the Kingfisher Fortnightly Bulletin to inform sea users.</p>	<p>NnGOWL submitted a notice confirming the Completion of the Licensed activities in the Kingfisher Fortnightly Bulletin.</p>

Appendix B – Marine Mammal Recording Forms

Marine mammal recording forms to be attached separately to this report as Excel Spreadsheets.