AECOM
Sunley House
4 Bedford Park
Croydon, CR0 2AP
England
aecom.com

To:
Licensing Operations Team
Marine Scotland
375 Victoria Road
Aberdeen
AB11 9DB
MS.MarineLicensing@gov.scot

CC:
[Redacted] National Grid Electricity Transmission
[Redacted] National Grid Electricity Transmission
[Redacted] SSE Transmission
[Redacted] SSE Transmission

Annexes:
Original EPS Risk Assessment and survey route shapefile also included in submissio email/A

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Eastern Green Link 2

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[Redacted] AECOM

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Addendum to the Existing European Protected Species Licence Application Supporting Information and Risk Assessment

Subject: EPS Licence Variation BS-00010241 & EPS-00010242

Introduction

This technical note serves as an addendum to support a licence variation request for the following issued licences:

- a European Protected Species (EPS) licence, EPS-00010242; and
- a Basking Shark licence BS-00010241.

A licence variation is required as the Eastern Green Link (EGL2) UXO survey methodology has now been updated to include sub-bottom profiling (SBP), another geophysical acoustic sound source, in addition to the operation of multi-beam echo sounding (MBES), side scan sonar (SSS) and underwater acoustic positioning (ultra-short baseline; USBL) granted permission under the licences referred to above.

This technical note carries out a risk assessment to consider the potential effects of the SBP survey on species of conservation concern in the context of relevant legislation and guidance (see Section 2 of the original European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, 2023)) assessing the need for an EPS licence variation and providing the information required by the Marine Directorate Licencing and Operations Team (MD-LOT) in support of any such variations. As such, any activities in relation to SBP which have the potential to impact Marine Protected Areas (MPAs), EPS, and additional Marine Protected Species (MPS) (such as seals and basking shark (*Cetorhinus maximus*)), have also been assessed in this technical note.

Please note, that this addendum exclusively addresses the assessment of SBP survey methodology as the newly integrated component of the Marine Scheme, while any other evaluations of project activities are assessed and referred to the original EPS Risk Assessment (AECOM, 2023). Furthermore, the survey route, extent of the Marine Scheme and use of proposed vessels are expected to be the same as detailed in the original European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, 2023). Further detail on the overall Marine Scheme and proposed activities can be found in the original EPS Risk Assessment (AECOM, 2023).

Timing and Duration

The UXO geophysical survey is anticipated to commence October 2023[1]. However, the exact programme is subject to the appointment of the survey contractor, vessel availability, their final survey strategy and weather conditions.

Currently, the total survey duration is anticipated to be approximately 130 days (including weather and other downtime). Within this period, works shall be completed in the nearshore and offshore areas of the route concurrently. A breakdown of the approximate survey durations within each sea area is shown in Table 2 below. These durations have been calculated on a pro-rata basis and are indicative only.

Within English waters, surveying in nearshore areas is expected to take approximately 20 days to complete whilst surveying of the remaining territorial and offshore waters is expected to take 12 and 73 days, respectively. Within Scottish waters, geophysical survey of the nearshore and the remaining territorial and offshore waters is expected to take approximately 37, 8 and 38 days, respectively.

Works within the territorial and offshore areas will be undertaken 24-hours a day, seven days a week whereas within the nearshore area a 12-hour working day shall be adopted seven days a week.

The licence variation application is made for the period of 16 October 2023 to 31 March 2024.

Description of Proposed Sub-Bottom Profiling Surveys

As highlighted in the original European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, January 2023), the UXO geophysical surveys included acoustic survey activities that have the potential to disturb EPS. This technical note exclusively addresses the assessment of an additional geophysical acoustic source, the SBP surveys, as the newly integrated component of the UXO geophysical surveys.

SBP is an acoustic technique that facilitates the penetration of the seafloor, capturing detailed images of sub-surface sediment layers, geological structures and other features to acquire comprehensive data on the sub-seafloor environment.

The make and model presented in Table 1 is an example of a system that may be used for the SBP surveys (consistent with the Applicant's previous UXO geophysical survey experience).

Table 1. Example equipment specifications for the nearshore and offshore SBP survey areas

[1] Survey activity (less the use of SBP) has already been permitted by MD-LOT (EPS-00010242 and BS-00010241); this variation is sought to maximise the quality and benefits of the campaign with the additional use of SBP. Until a judgment on the variation is confirmed by MD-LOT, the existing permissions through the current EPS licence are considered to be valid.

Survey activity	Equipment specification	Nearshore survey – example make and model	Offshore survey - example make and model
Marine Sub-Bottom Profiling (SBP)	An appropriate high-resolution system comprising a pinger (either hull or tow-fish mounted), sub-bottom profiler and chirp systems. Suitable deeper penetration systems include boomers and mini-sparkers.	Innomar SES-2000, Edgetech Chirp & Applied Acoustics 201 boomer	Innomar Medium 100

Sound Source Levels emitted from SBP

SBP surveys emit sound during operation by transmitting acoustic signals into the water column. These signals penetrate the seafloor and underlying sediment layers to create detailed images of the sub-surface geological structures. While essential for geological investigations, these emitted sounds can potentially impact marine ecological receptors. Therefore, it is necessary to calculate the level of sound propagation produced by SBPs to assess the potential impacts on EPS.

To calculate the level of sound propagation needed for the assessment of impacts to EPS, the maximum noise output, or Sound Source Level (SSL) for SBP survey activity is required. These values depend on the equipment being used, the power level at which it is being operated and the pulse length.

At the time of writing, a contractor for the UXO geophysical survey had not been appointed. Therefore, for the purpose of this assessment, published SSLs have been used. These SSLs, which are presented in Table 2 have been derived from user manuals and/or survey data and assume that the equipment is being operated at the highest power levels and the longest pulse lengths. This provides the most conservative SSLs and ensures the assessment is representative of worst-case.

The SBP will have a primary operating frequency of 100 kHz during the geophysical surveys which is within the hearing range of cetaceans (see Table 5) and is **therefore screened in for further assessment of impacts to EPS.**

Table 2. Maximum sound source levels for SBP survey

Survey activity Frequency (kHz)	Survey activity Frequency (kHz)	Maximum Sound Source Level (SPLrms dB re 1 uPa @1m)	Reference
Marine sub-bottom profiling (SBP)	Primary frequency is 100 kHz (band 85 – 115 kHz)	238 dB	Innomar (2023)

Actions Requiring Licencing

Although the UK is no longer part of the European Union (EU), in the UK, the strict protection for european protected species (EPS) are transposed into law by The Conservation (Natural Habitats, &c.) Regulations 1994, The Conservation of Habitats and Species Regulations 2017, and The Conservation of Offshore Marine Habitats and Species Regulations 2017. These regulations, known as the Habitats Directive, are still in force following the UK's withdrawal from the EU, meaning the strict protections for EPS remain.

All cetaceans and marine turtles are listed under Annex IV of the Habitats Directive. As such it is an offence to deliberately capture, injure or kill an EPS (including all cetaceans); deliberately disturb an EPS; or damage or destroy a breeding site or resting place of an EPS (see Section 2 of the original European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, 2023)).

Therefore, this technical note and associated risk assessment are submitted in relation to the potential for SBP survey activities, as described above, to disturb EPS.

Other relevant MPS considered as part of this assessment include:

- Pinnipeds (harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*)): These are protected under the Protection of Seals (Designated Sea Haul-out Sites) (Scotland) Order 2014, and Marine (Scotland) Act 2010;
- Basking shark: Protected under the Wildlife and Countryside Act 1981 (as amended).

The key pathways for potential impacts are:

- Lethal effect and physical injury to EPS and MPS from SBP survey activities;
- Underwater sound disturbance to EPS and MPS from SBP survey activities; and
- Increased risk of collisions with EPS and MPS.

Summary of Baseline Conditions

The defined study area and full baseline description is detailed in the original European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, 2023) and should therefore be read in conjunction with this technical note. However, in summary, based on the information provided in Section 4.2 and 4.3 of the original European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, 2023), the species that will be considered further within the risk assessment are:

Cetaceans:

- Harbour porpoise (*Phocoena phocoena*);
- Bottlenose dolphin (*Tursiops truncatus*);
- White-beaked dolphin (*Lagenorhynchus albirostris*); and
- Minke whale (*Balaenoptera acutorostrata*).

Pinnipeds:

- Harbour seal; and
- Grey seal.

Approximate abundances and densities for the four frequent/resident cetacean species within the vicinity of the Marine Installation Corridor (as defined and shown in the European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, 2023)) are provided in Table 3 and Table 4 below. These data are based on the most recent SCANS-III surveys for survey Block O and R (Hammond, *et al.,* 2017 and Hammond, et al., 2021).

Block O has a particularly high abundance and density of harbour porpoise whilst Block R immediately to the north has a high abundance and density of all four species (in relative terms).

Table 3. Summary of abundance and density estimates for the four key cetacean species by SCANS-III survey block.

SCANS-III Survey Block	Species	Density (individuals/km^2)	Total population size per block
O (East coast of England)	Harbour porpoise	0.888	53,485
	Bottlenose dolphin	0	0
	White-beaked dolphin	0.002	143
	Minke whale	0.010	603
R (Northeast of England and east of Scotland)	Harbour porpoise	0.599	38,646
	Bottlenose dolphin	0.030	1,924
	White-beaked dolphin	0.243	15,694
	Minke whale	0.039	2,498

Source: (Hammond, *et al*., 2021)

As detailed in the original European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, 2023), the following species will not be considered further in the risk assessment due to their rarity on the east coast of Scotland and northeast England, and/or low sensitivity to underwater sound disturbance:

Fish species:

- Basking shark;
- Sandeel (*Ammodytes tobianus*);
- Sea lamprey (*Petromyzon marinus*);
- River lamprey (*Lampetra fluviatilis*); and

Sea turtles:

- Leatherback sea turtle (*Dermochelys coriacea*);
- Loggerhead sea turtle (*Caretta caretta*);
- Green sea turtle (*Chelonia mydas*);
- Hawksbill sea turtle (*Eretmochelys imbricata*); and
- Kemp's Ridley sea turtle (*Lepidochelys kempii*).

Risk Assessment

As discussed in the above sections, SBP surveys emit underwater sound during operation and therefore may impact EPS species present in the vicinity the survey.

Underwater Sound and Marine Mammals

Ambient underwater sound is the background sound level made up of a broad range of individual sound sources present in the ocean of both natural and anthropogenic origin. Many marine organisms, including marine mammals and fish, use sound for communication, to locate mates, to search for prey, to avoid predators and hazards, and in the case of cetaceans, for short- and long-range navigation (OSPAR, 2009).

Anthropogenic underwater sound sources arise from man-made activities in and near the sea such as dredging, construction, hydrocarbon exploration and production, geophysical surveys and the operation of sonar equipment (Richardson, Greene, Malme, & Thomson, 1995). Vessel movements also have the potential to produce a significant amount of underwater sound.

The proposed SBP survey will use an acoustic sound source to gather acoustic imagery and bathymetry that could affect marine fauna.

Marine Mammal Hearing Sensitivity and Anthropogenic Sound

Sound from anthropogenic activities can negatively impact marine mammals as it influences their ability to echolocate, communicate and it can cause physical harm (through disorientation leading to beaching, and in extreme cases, trauma to the auditory apparatus) (Southall*, et al.,* 2007). Sound can cause certain cetacean species to change their behaviour and may result in increased alertness, modification of vocalisations, interruption, or cessation of feeding or social interactions, alteration of movement or diving behaviour, and temporary or permanent habitat abandonment. In severe cases, animal responses may include panic, flight, or stranding, which could sometimes result in indirect injury or death.

Cetaceans produce and receive sound over a wide range of frequencies for communication, orientation, predator avoidance and foraging (Tyack, 2008). For the determination of the impact of underwater sound on

cetaceans they have been classified into three functional hearing groups (low, high and very high frequency[2]) based on their peak hearing (Table 5).

Different species will be sensitive to different frequencies and the harbour porpoise, the most common species around the Marine Scheme, is known to be particularly sensitive to underwater sound. The harbour porpoise is categorised in the very high frequency (VHF) functional hearing group. There will be high frequency hearing dolphin species also present, but these are generally much less sensitive to underwater sound.

Seals also produce a diversity of sounds, though generally over a lower and more restricted bandwidth (generally from 100 Hz to several tens of kHz) (Table 5). Their sounds are used primarily in social and reproductive interaction, both in water and air (Southall, et al., 2007).

Table 4. Functional marine mammal hearing groups and auditory bandwidth and potential species within the study area

Cetacean hearing group	Species groups	Estimated auditory bandwidth	Key species potentially present in survey area
Low frequency (LF)	Baleen whales	7 Hz to 35 kHz	Minke whales
High frequency (HF)	Dolphins, toothed and beaked whales	150 Hz to 160 kHz	Bottlenose dolphin White beaked dolphin
Very High frequency (VHF)	True porpoise and some small whales	275 Hz to 160 kHz	Harbour porpoise
Pinnipeds in water (PW)	Seals	50 Hz to 86 kHz	Grey seal

Source: Southall et al. (2007); NMFS (2018); and Southall et al. (2019).

There are four species of cetacean occurring in the SCANS III study areas around the Marine Scheme at an abundance high enough for animal density estimates to have been determined (Hammond *et al.,* 2021). These are the harbour porpoise (VHF), the white beaked dolphin (HF), the bottlenose dolphin (HF) and the minke whale (LF). There is, therefore, potential for animals in each of three functional hearing groups to be present in the vicinity of the Marine Scheme during survey activities.

The impact of underwater sound in marine mammals is generally split into the following categories:

- **Auditory injury** - a consequence of damage to the inner ear of marine mammals, the organ system most directly sensitive to sound exposure, which can result from either brief exposure to extremely high sound levels or following more prolonged exposure to lower levels of continuous sound (Richardson, Greene, Malme, & Thomson, 1995). This damage is a change in hearing sensitivity and is known as a hearing threshold shift, which may be a permanent (PTS) or temporary (TTS). Only PTS is considered to be injury as following TTS hearing does return to normal.;
- **Behavioural responses** – are highly variable and context-specific, ranging from increased alertness, alteration of vocal behaviour, interruption to feeding or social interaction, alteration of movement or diving behaviour, temporary or permanent habitat abandonment. In some circumstances, sound from explosions or military sonar, have been associated with animal responses such as panic, flight, or stranding, sometimes resulting in indirect injury or death. Minor or temporary behavioural responses are often simply evidence that an animal has heard a sound. Anthropogenic underwater sound may also partially or entirely reduce the audibility of signals of interest such as those used for communication and prey detection.

Impact Threshold Criteria of Marine Mammals

The most up to date sound exposure criteria for auditory injury in marine mammals have been published by the US National Marine Fisheries Service (NMFS), often referred to as the NOAA criteria (NMFS, 2018), and updated in a recent peer-reviewed academic paper (Southall, et al., 2019). The thresholds for PTS based on unweighted, instantaneous peak sound pressure levels (SPL_{peak}) are shown in Table 6.

[2] As defined in Southall et al. (2019). These groupings were previously described, by Southall et al., 2007, as low, mid, and high frequency functional hearing groups.

Underwater Sound Propagation Calculations

To assess the impact of underwater sound on marine mammals, it is necessary to calculate the propagation of underwater sound through the water column. Sound attenuates as it propagates through water and the local oceanographic conditions will affect both the path of the sound into the water column and how much sound is transmitted. A standard geometric spreading calculation was used to determine the propagation of underwater sound from the SBP. The spreading model assumes that sound is spread geometrically away from the source with an additional frequency-dependent absorption loss; it therefore provides conservative estimates, representing a worst-case scenario. It also does not take into consideration the conditions within the area, such as detailed bathymetry, water column structure or sediment type and thickness.

The standard formula used for estimating the transmission loss from underwater sound sources is:

$$TL = A \log (r) + B\, r + C$$

Where:

TL is the transmission loss at a distance r from the source.

A is the wave mode coefficient. For spherical waves A=20, and cylindrical waves A=10.

B is an attenuation factor that is dependent on water depth and sea bottom conditions.

C is a fixed attenuation due to acoustic screening. In open water this will be 0.

Note that use of cylindrical spreading (A=10) is generally suited to shallow-to-mid water depths, and spherical spreading (A=20) is generally applicable to deep water depths. Although the definition of deep vs. shallow is somewhat dependent on wavelength, Richardson et al. (1995) suggests that depths <200 m are commonly regarded as “shallow” and >200 m are commonly regarded as “deep” regardless of source wavelength.

Cylindrical spreading (A=10) is more conservative (i.e., provides larger setback distances for a given source level). Richardson (1995) suggests using A=15 for underwater transmission in shallow water conditions where the depth is greater than five times the wavelength. For low frequency, longer wavelength sound this is going to tend toward A=20. For high frequency, shorter wavelength sound this is going to tend toward A=10.

For the purposes of this assessment and to provide a conservative but reasonably realistic estimate of sound propagation, an empirical wave mode coefficient A = 15 has been used to determine the distance at which SPL thresholds for PTS are met.

To identify the maximum distance at which injury impacts may occur, dual criteria based on sound pressure level (SPL) and sound exposure level (SEL) are generally used, and the greatest ZoI considered for the assessment (Southall et al., 2007; NMFS, 2018; Southall et al., 2019). However, for injury based on a pulsed sound source from geophysical equipment, the SPL_{peak} has been used. This is because the SPL_{peak} is likely to be the greatest risk for EPS as the source will be passing by, so the length of exposure will likely be low. SEL distances calculated using simple geometric spreading formula are also significantly over estimated. Thus, it is more appropriate in this instance to focus on the instantaneous sound source (i.e. SPL_{peak}) predictions.

Table 5. Maximum estimated distances (m) from SBP at which the sound level will exceed the SPL_{peak} PTS injury threshold

Cetacean hearing group	SPL_{peak} PTS threshold	Maximum distance (m) at SPL_{peak}
LF	219	18
HF	230	<10
VHF	202	251
PW	218	22

Source: NMFS (2018); and Southall et al. (2019). SPL thresholds are unweighted peak SPL in dB re 1 µPa.

Impact Assessment – Increased underwater sound from SBP surveys

There are a number of potential impacts from the production of underwater sound and these are considered in relation to the inclusion of SBP during the UXO survey:

Lethal effect and physical injury

Evidence of direct lethal effects and physical injury in marine mammals, as a result of anthropogenic sound sources, is limited to animals in very close proximity to impulsive sound sources of very high intensity such as explosions and military sonar (Southall et al., 2007). There is very limited evidence of lethal effects caused by sound sources associated with the geophysical survey equipment and therefore lethal effects to cetaceans from this activity, even indirectly, are not predicted to occur.

Auditory Injury Impacts

The predicted injury impact zone from SBP sound, based on SPL_{peak} thresholds indicates that very high frequency cetaceans are, as would be expected, the most sensitive to geophysical survey acoustic outputs. However, PTS resulting from the operation of SBP would only be likely to occur in very close proximity of the sound source itself. This is to a distance of 251 m of the sound source for harbour porpoise, the only high frequency cetacean in the survey area, and up to only 22 m for all other marine mammal groups including seals.

However, to minimise the potential for injury to cetaceans from the geophysical survey activities the survey design includes a number of measures, based on the 2017 JNCC guidance for geophysical surveys (JNCC, 2017), as standard operating procedure. These are:

- Firstly, before an acoustic source based activity starts up, there will be a period of observation by a Marine Mammal Observer or a passive acoustic monitoring system operator in the case of offshore operations during the hours of darkness, of a 500 m zone. Thus, the likelihood that any animals are within 500 m of the source when it starts is very low.
- Following the observation period survey activities commence with a soft-start (where the facility is available), with sound intensity building to full power gradually over time, increasing the time available for any cetaceans to move away, before sound levels reach injurious levels. Further information regarding these mitigation measures can be found in Section 7 of the original European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, 2023).

Behavioural Disturbance

Behavioural disturbance may occur from the use of SBP. There are no widely agreed quantitative thresholds for behavioural disturbance, reflecting both a lack of empirical evidence and a high level of variability in behavioural responses, which are often unrelated to the sound level received (Gomez, et al., 2016; Southall, et al., 2021). Nevertheless, a threshold of 160 dB SPL_{rms} is still adopted by NOAA in relation to behavioural disturbance from impulsive sounds (representing a strong behavioural reaction). To account for the directionality of the acoustic sound source (Landrø & Amundsen, 2010) a conservative reduction in source level of 20 dB SPL_{rms} has been assumed for behavioural disturbance, which takes place at some distance from the source and was estimated to be 4,642 m (NGET and SHETP, 2022).

The zone of influence for SBP is comparable with observations of behavioural disturbance in harbour porpoise in relation to geophysical surveys (Thompson, et al., 2013) and the ‘effective deterrent range’ (EDR) of 5 km recommended by JNCC (2020). The EDR applies specifically to harbour porpoise only, as this species is known to be highly sensitive to underwater sound and for which there is a greater body of evidence regarding behavioural disturbance.

Several field studies around wind farm installation activities and geophysical and seismic surveys, have shown that harbour porpoise demonstrate strong behavioural reactions to underwater sound. The density of animals and vocalisations are reduced temporarily for several kilometres around the noise source with gradually less of an effect the further away the observations are made e.g., Lucke, Lepper, Blanchet, & Siebert (2009), Stone & Tasker (2006) and Dahne (2013).

The most common species in the study area, is the harbour porpoise, occurring at a density estimated between 0.599 and 0.888 individuals/km^2 (Table 3). The harbour porpoise is also the species with the highest sensitivity to sound and is a designated feature of the Southern North Sea SAC, approximately 19 km away to the east / southeast. Harbour porpoise are highly mobile and found throughout the North Sea with extensive foraging grounds and alternative feeding locations readily available. If individuals are disturbed temporarily, alternative areas suitable for foraging and socialising, exist to move into. Given the very small distance over which behavioural disturbance may occur from SBP operations, any impact on foraging or other behaviours is expected to be negligible.

The estimated number of cetaceans which may experience disturbance during SBP operations, based on the worst-case scenario of a 5 km radius disturbance zone (JNCC, 2020), has been calculated in Table 7, based on the estimated population data in Table 3. In these calculations, the impact range results in a potential disturbance area, which is centred around the survey vessel, and this therefore considered to comprise a total area of 78.54 km^2. The calculations assume the same disturbance zone for all species, recognising this is an overestimate of effect, likely in all other marine mammal species other than harbour porpoise, but particularly in relation to the high frequency dolphin species and seals.

For cetaceans, the proportion of animals potentially disturbed by the SBP is less than 1% of the total populations estimated to present in the SCANS III survey blocks to which the density estimates apply. The percentage of cetaceans as a proportion of the total MU population will be even lower, less than 0.1% (Table 7).

The proportion of the four key cetacean species populations that could be present in the survey area and potentially subject to behavioural disturbance is low. Across the survey region, accounting for the density of animals reported by SCANS III, it is estimated that less than 0.02 % of the total harbour porpoise population within each SCANS III Block R and Block O would potentially experience observable disturbance (Table 7).

Proportions for the other species populations are similar. However, the same indicative impact zone (a 5 km radius) has been used even though these species are likely to exhibit much lower levels of response and therefore the proportions are likely to be an overestimate. The species that would potentially experience the highest observable disturbance is bottlenose dolphin in Block O, with 0.1% of the population potentially being disturbed. However, this is still well below 1% and the potential impact therefore considered to be low.

Although some individuals will be disturbed, only a small proportion of the local population is likely to be affected, and for a relatively short period of time. Thus, the potential impact of the UXO geophysical survey activities on EPS, in both Scottish and English waters is low.

Table 6. Estimated maximum number of individuals within 5 km radius of survey vessel.

SCANS-III Survey Block	Species	Density (individuals/km^2)	No. of Individuals within 5 km radius (78.54 km^2)	Proportion of management unit population (%)
Scotland SCANS III Block R	Harbour porpoise	0.888	69.74	0.02
	Bottlenose dolphin	0	0	<0.01
	White-beaked dolphin	0.002	0.16	<0.01
	Minke whale	0.010	0.79	<0.01
England SCANS III Block O	Harbour porpoise	0.599	47.05	0.01
	Bottlenose dolphin	0.030	2.36	0.10
	White-beaked dolphin	0.243	19.09	0.04
	Minke whale	0.039	3.06	0.02

Any potential offence in relation to seals refers to disturbance only at haul-out sites. The closest seal haul-out location to the Marine Installation Corridor is the Ythan Estuary (grey seal), 25 km to the south of the Scottish landfall, also significantly beyond the distance of any potential impacts. Grey seals forage over extensive distances and so there may be individuals in the vicinity of the Marine Installation Corridor, particularly in

area closest to the Farne Islands where there is a very high density of seals. Any at sea disturbance would be short-term, temporary, and limited to very few individuals.

To conclude, there is no potential for injury to marine mammals as a result of underwater sound generated by the SBP operations, given the adoption of the JNCC guidelines. Furthermore, behavioural disturbance is considered to be negligible given the small distances over which this may occur. As the vessels are continuously moving, any impacts are transient, whilst the duration is considered to be short-term, intermittent, and temporary. Any effects are limited in terms of the number of individuals disturbed as a proportion of the total MU population and the level of behavioural response. Therefore, the effect to marine mammals (including EPS) from **underwater sound is not significant.**

Assessment of Potential Offence

The assessment of potential effects for underwater sound from the SBP equipment as part of the UXO geophysical survey concluded that there is no potential for the sounds emitted to cause auditory injury in EPS, particularly given the adoption of the proposed embedded mitigation measures. Furthermore, any behavioural disturbance is considered to be minor. Therefore:

- Disturbance from operation of during the SBP survey work can be considered to be minor and unlikely to be detrimental to the maintenance of the range of cetacean populations at a Favourable Conservation Status (FCS) in their natural range, as defined in the Offshore Regulations 2017.
- Following the 2014 guidance published by Marine Scotland for territorial waters, there is the potential for disturbance of animals, from the use of the geophysical positioning system, SBP, associated with the proposed survey. However, the estimated proportion of the cetacean population in the total survey area is low and this disturbance will not be sufficient to cause any population level effects therefore it is considered that an **EPS licence (in Scottish waters) and Marine Licence exemption notification (in English waters) can be issued.**

Consideration of Designated Sites and Priority Marine Features

As the only variation required relates to the addition of SBP equipment, and the survey route remains exactly the same, all potential impacts to relevant designated sites and Priority Marine Features in relation to the Marine Scheme have been identified and assessed in the original European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, 2023). A total of six designated sites relevant to marine mammals (i.e., Special Areas of Conservation (SACs), Marine Protected Areas (MPAs), were considered in the assessment.

The addition of SBP surveys as part of the UXO geophysical survey work will not result in any additional potential impacts to those already discussed in Section 6.2 of the original European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, 2023). As outlined in the behavioural disturbance sub-headings above, underwater sound disturbance from the SBP survey equipment used as part of the UXO geophysical survey is not predicted to have a significant impact on cetacean or pinniped species. As such, there is predicted to be no significant effect to any designated site for which cetaceans and pinnipeds are a qualifying feature. As part of this assessment, industry standard JNCC guidelines in relation to the operation of these equipment (JNCC, 2017) have been adopted (as outlined in Section 7 of the original European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, 2023)).

Thus, underwater sound effects from the UXO geophysical survey activities (including SBP surveys) to any designated site or species which is a qualifying feature, is considered to be **not significant.**

Mitigation Measures

The SBP surveys will include underwater sound sources that could potentially harm very high frequency marine mammals, in particular the harbour porpoise, present within 251 m of the sound source. It also has

the potential to cause minor behavioural disturbance within 5 km of the survey vessel. A number of mitigation measures have been included in the original EPS Risk Assessment (AECOM, 2023) which will apply to the SBP surveys. These mitigation measures are based on industry-standard 2017 JNCC guidelines (JNCC, 2017) for minimising the risk of injury to marine mammals from geophysical surveys. The mitigation measures implemented will be documented and be provided to Marine Directorate and JNCC following survey completion.

The full description of these mitigation measures is included in Section 7 of the original European Protected Species Licence Application Supporting Information and Risk Assessment (AECOM, 2023).

The SBP operations have been entered into the JNCC Marine Noise Registry (MNR). The references are: 3559 – Marine Directorate and 3560 - MMO. The MNR close out reports deadline is 24 March 2024.

Conclusions

This assessment of the potential for impacts on EPS from activities associated with the SBP survey work for the Marine Scheme concluded that, after adopting mitigation and the industry standard JNCC guidelines (JNCC, 2017):

- There was negligible potential for lethal effects to marine EPS;
- The potential for physical or auditory injury was considered to be negligible; and
- The potential for behavioural disturbance was considered to be low within the context of the wider populations of EPS.

Therefore, any disturbance caused by the SBP surveys as part of the UXO geophysical surveys **will be insufficient to cause any population level effects**, and thus an **EPS licence variation for the existing licences BS-00010241 & EPS-00010242 to disturb can be issued under Section 39 of The Conservation (Natural Habitats, &c) Regulations 1994 (as amended in Scotland).**

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