REPORT

Port of Dundee

Geophysical Survey EPS Risk Assessment

Client:	Port of Dundee Limited
Reference:	PC6550-RHD-XX-XX-RP-EV-0097
Status:	Final/2
Date:	3 February 2026

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Enhancing Society Together

HASKONING UK LTD.

4th Floor
15 Bermondsey Square
London
SE1 3UN
United Kingdom
Industry & Buildings
VAT registration number: 792428892

Phone: +44 0207 222 2115
Email: info@uk.haskoning.com
Website: haskoning.com

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1 Introduction

One of the primary uses of the Port of Dundee is the service and support of the offshore renewables industry. The port provides facilities for the transhipment and storage of components such as all wind turbine generator (WTGs) and other component parts associated with wind farm projects. Due to the increased water depth required by vessels used by the offshore renewables industry, Port of Dundee Limited is proposing to undertake a suite of works at the Port of Dundee and to the Lady Shoal approach channel. Marine licences for these works were issued in December 2025 (reference MS-00011344 & MS-00011345).

A geophysical survey of the capital dredge footprint and surrounding area is proposed to identify potential UXO risk. As underwater noise can cause disturbance to cetaceans, an application for a European Protected Species (EPS) licence may be required for the undertaking of geophysical surveys. Where there is the possibility for disturbance to EPS, an EPS Risk Assessment (RA) must be carried out.

1.1 Determining the need for a Marine EPS Licence

The purpose of the EPS RA presented in this report is to determine whether, following implementation of an appropriate mitigation strategy, there is potential for the proposed geophysical survey to cause deliberate harm or inadvertent disturbance to EPS. The need for a Marine EPS Licence will be determined by the Marine Directorate Licencing Operations Team (MD-LOT), in consultation with NatureScot (the Statutory Nature Conservation Body for Scotland), based on the findings of the EPS RA. Consideration of whether a Marine EPS Licence can be granted comprises three tests[1]:

1. To ascertain whether the licence is to be granted for one of the purposes specified in Regulation 44(2) of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) ('the Habitats Regulations');
2. To ascertain whether there are no satisfactory alternatives to the activity proposed (that would avoid the risk of offence); and
3. That the licencing of the activity will not be detrimental to the maintenance of the populations of the relevant species at Favourable Conservation Status (FCS)[2].

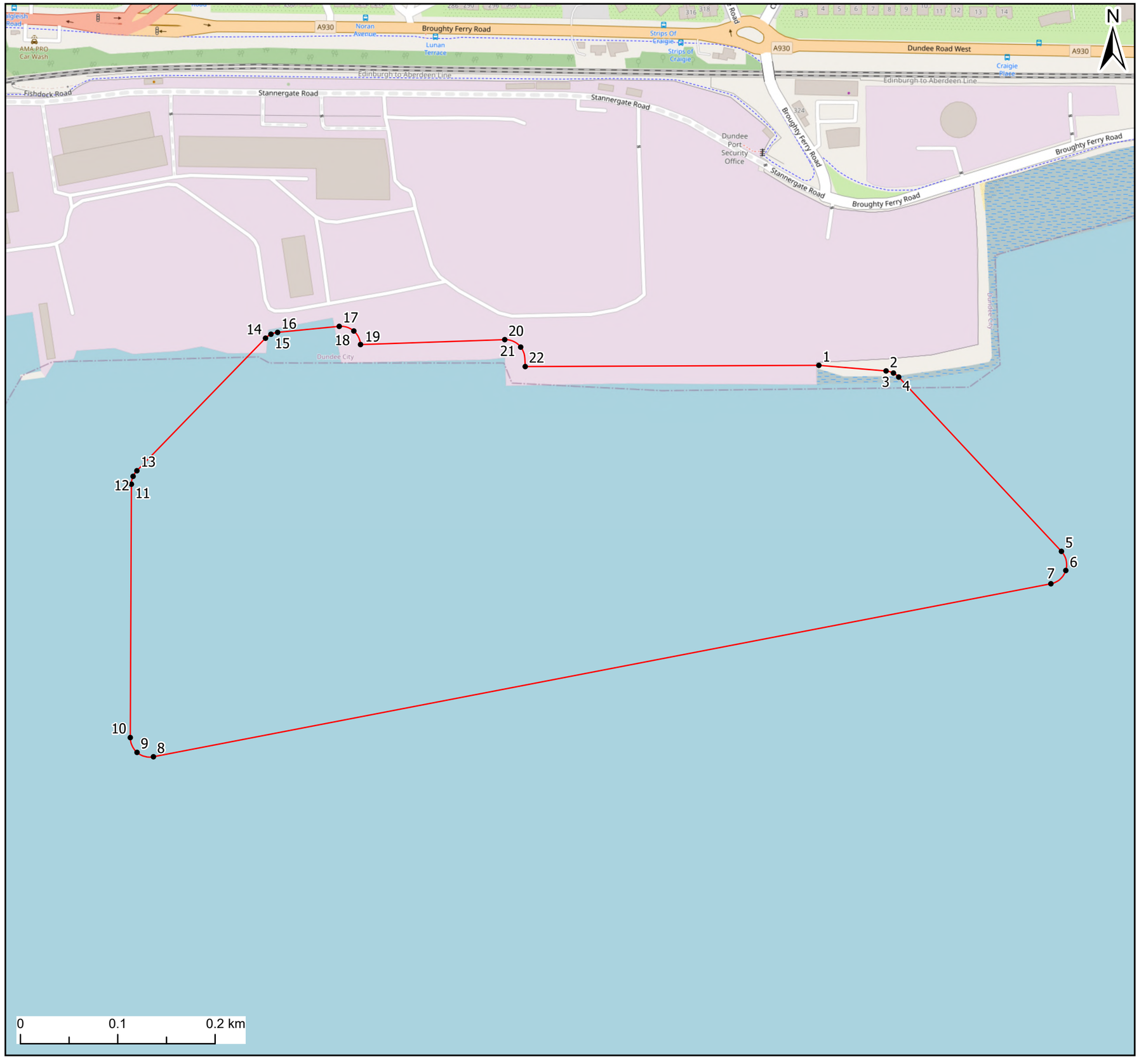
These tests are considered in **Section 5**.

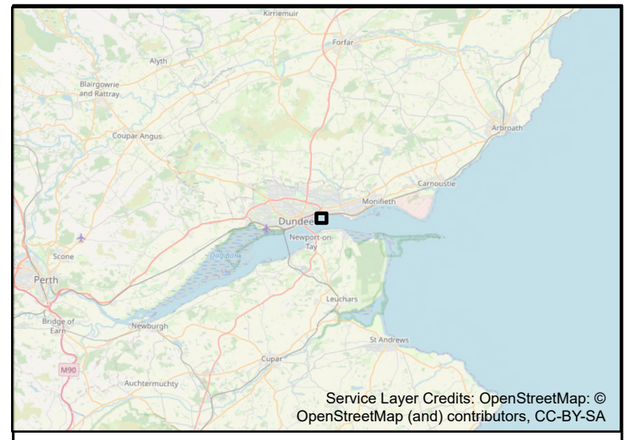
1.2 Geophysical survey methodology

The geophysical survey would be undertaken in the areas shown in **Figure 1** and **Figure 2** between March 2026 and March 2027; however, the geophysical survey will only be undertaken over a very short time period of up to four weeks. If required, further surveys will be undertaken, with an estimated additional eight weeks of survey effort required, spread over the licenced period. Any further survey would not last longer than four weeks.

The proposed geophysical survey equipment is to be confirmed; however, will have a frequency range of 5 to 25kHz (an example is the eBOSS system, a sub-bottom profiler (SBP)). The survey will be undertaken using a Remote Operated Vehicle (ROV) or a vessel or a combination of both.

[1] *European protected species licensing | NatureScot*
[2] *The Habitats Directive defines conservation status as 'favourable' when population data on a species indicate it is maintained on a long-term basis as a viable component of its natural habitats, when the natural range of the species will not be reduced for the foreseeable future and when there is sufficient habitat to maintain populations on a long-term basis.*





Legend:

- Geophys Survey Area
- Geophys Survey Area Vertices

Client:	Project:
Port of Dundee Limited	Port of Dundee Laydown Area and Quay Improvement Works

Title: Port of Dundee Geophysical Survey Area

Figure:	Drawing No:
1	PC6550-RHD-XX-XX-D-EV-0097

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Co-ordinate system: British National Grid

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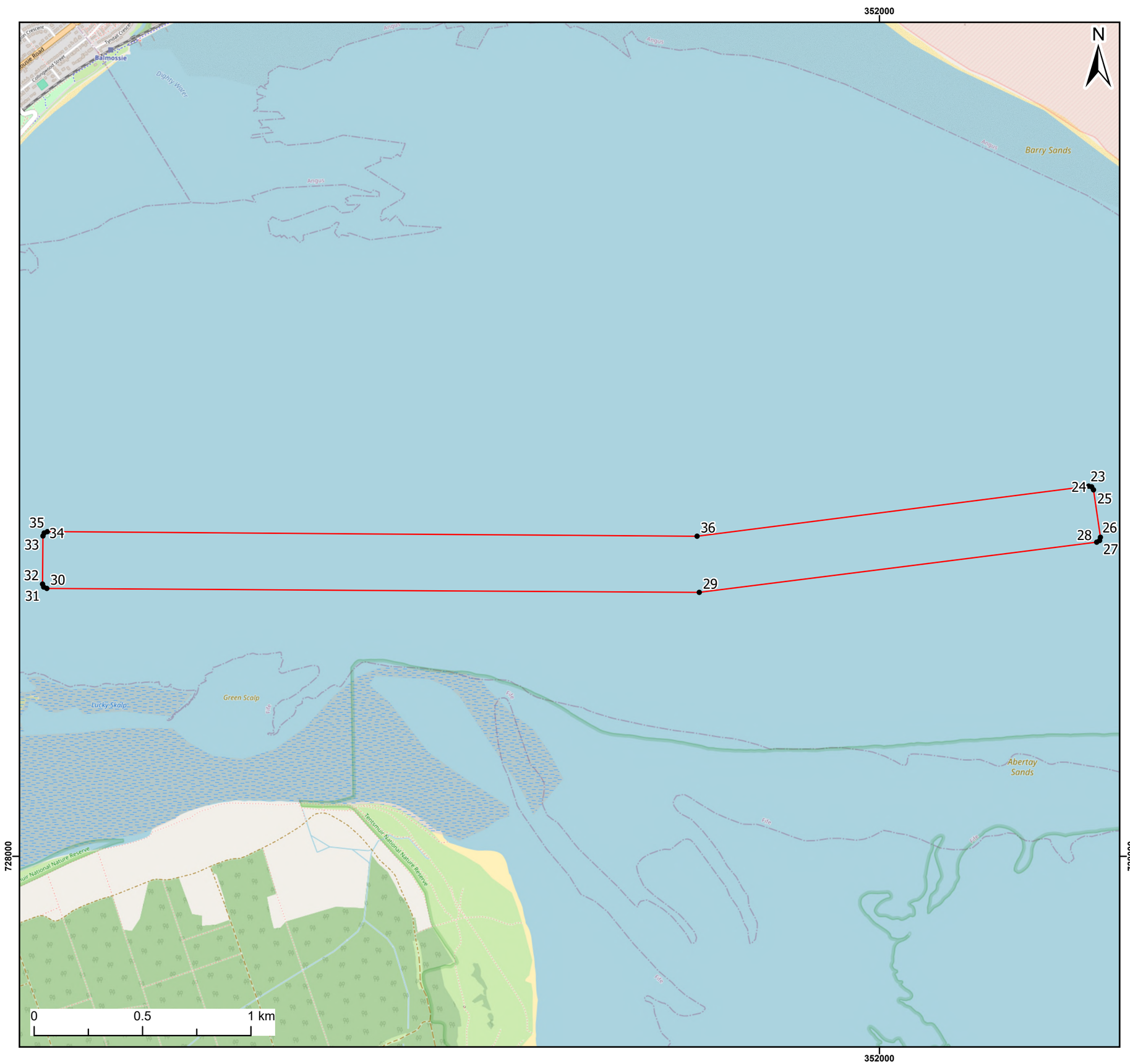

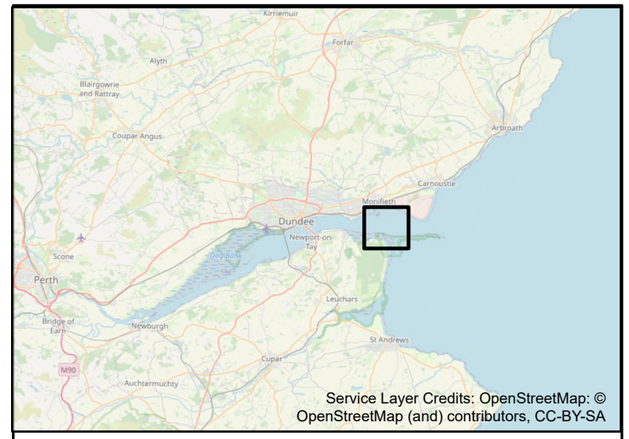

Legend:

- Geophys Survey Area
- Geophys Survey Area Vertices

Client:	Project:
Port of Dundee Limited	Port of Dundee Laydown Area and Quay Improvement Works

Title:

Lady Shoal Geophysical Survey Area

Figure:	Drawing No:
2	PC6550-RHD-XX-XX-D-EV-0097

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1.3 EPS presence in the survey area

Annex IV of the Habitats Directive lists all cetacean species as EPS. These species are fully protected in Scottish territorial waters under the Habitats Regulations. Bottlenose dolphin *Tursiops truncatus* and harbour porpoise *Phocoena phocoena* are also listed in Annex II of the Habitats Directive and thus require Special Area of Conservation (SAC) designation.

A review of the SCANS-IV surveys (Gilles *et al*., 2023) and a data review by Waggitt *et al.* (2019) indicates that there are five cetacean species known to occur near to the Firth of Tay, including: harbour porpoise, bottlenose dolphin, minke whale *Balaenoptera acutorostrata*, and white-beaked dolphin *Lagenorhynchus albirostris*. Reported sightings of marine mammal species to the Seawatch Foundation in 2025 (from January to December), near to the Port of Dundee, include mainly bottlenose dolphin and harbour porpoise, with lower numbers of sightings of minke whale and common dolphin *Delphinus delphis*.

The assessment will cover all cetacean functional hearing groups and therefore any mitigation measures in place would be suitable for other rare species such as the humpback whale *Megaptera novaeangliae*.

The geophysical survey will encompass an area next to the Port of Dundee and an area within the Lady Shoal approach channel, see **Figure 1** and **Figure 2**, respectively. These locations are in Block NS-D of the SCANS-IV survey (Gilles *et al.,* 2023). There are only density estimates for harbour porpoise, minke whale and white-beaked dolphin within block NS-D of the SCANS-IV survey. There were no sightings of bottlenose dolphin and common dolphin for the survey to gain density estimates for the species within the NS-D block; therefore, density estimates gained from Waggitt *et al* (2019) have been used within this EPS RA. Species density estimates are as follows:

- Harbour porpoise – 0.5985 per km^2
- Bottlenose dolphin – 0.0001 per km^2
- White-beaked dolphin – 0.0799 per km^2
- Common dolphin – 0.006 per km^2
- Minke whale – 0.0419 per km^2

2 Assessment of potential for impact

Based on the proposed geophysical equipment the source levels (190 SPL dB re 1µPA m; 165 SEL dB re 1µPA2 m^2s)) of the equipment are outside of thresholds for permanent loss of hearing sensitivity (Permanent Threshold Shift (PTS)); therefore, this risk assessment will not assess for injury but will assess for the risk disturbance.

For any type of SBP equipment, most of the sound energy generated by the SBP equipment will be directed towards the seabed and the pulse duration is extremely short, limiting the potential for injury. An animal would need to remain in the very small zone of ensonification for a prolonged period, which is highly unlikely (JNCC *et al.,* 2010); however, localised short-term behavioural impacts, such as avoidance and displacement, may occur as a result of disturbance.

The current guidance within the JNCC Marine Noise Registry recommends the use of an effective deterrence radius of 5km for geophysical surveys, this applies to any type of sub-bottom profiler survey (JNCC, 2025a). This can be considered a conservative range; the modelling for BEIS (2020) predicted a maximum impact range of 3.77km for possible behavioural disturbance of harbour porpoise, based on a threshold of 140 dB re 1 µPa SPL unweighted (BEIS, 2020). The JNCC also reported updated Effective Deterrent Ranges (EDRs) for assessing the significance of noise disturbance in harbour porpoise SAC, the recommended EDR in this was updated to 3km (JNCC, 2025b).

A precautionary approach has therefore been undertaken, it has been assumed that all cetaceans within 5km of the survey source (an impact area of 78.5km² around a point source) could be at risk of disturbance. The JNCC Marine Noise Registry guidance also assumes a worst case maximum daily disturbance footprint of 256km^2 for any geophysical survey which will be a moving source (JNCC, 2025a); therefore, the disturbance for all species based on the maximum daily disturbance footprint has also been assessed.

Any disturbance from underwater noise and presence of vessels would be less than the potential disturbance areas assessed for the works themselves. Thomsen *et al.* (2006) used species hearing detection thresholds to conclude that noise from larger vessels around 0.25 kHz will be detected by harbour porpoise at distances of approximately 1km, and noise from smaller vessels around 2kHz will be detected at around 3km.

The total number of individuals that may be disturbed has been related to the overall population estimates for the relevant area, as defined by Inter-Agency Marine Mammal Working Group (IAMWWG) (2023).

2.1 Harbour porpoise

The estimated density of harbour porpoise in the SCANS-IV relevant survey Block NS-D is 0.5985/km^2 (Gilles *et al*., 2023) and the reference population for the North Sea Assessment Unit (AU) is 338,918, as the most recent estimate reported in the SCANS-IV report (Gilles *et al.,* 2023)).

The number of harbour porpoise that could be disturbed due to the geophysical survey, based on the precautionary disturbance distance of 5km (78.54km^2), is up to 47 individuals, or 0.01% of the North Sea AU. Based on the maximum daily disturbance footprint of 256km^2, up to 154 individuals, or 0.05% of the North Sea AU could disturbed. There is therefore a negligible risk of disturbance to the harbour porpoise population.

2.2 Bottlenose dolphin

The estimated density of bottlenose dolphin for the relevant survey area is 0.0001/km^2 and the reference population for the Coastal East Scotland (CES) MU is 226 (Waggitt *et al*., 2019; Cheney *et al*., 2024).

The number of bottlenose dolphins that could be disturbed due to the geophysical survey, based on the precautionary disturbance range of 5km (78.54km^2), is up 0.008 individuals, which represents 0.004% of the CES MU population. Based on the maximum daily disturbance footprint of 256km^2, up to 0.03 individuals, or 0.01% of the CES MU population could disturbed. There is therefore a negligible risk of disturbance to the bottlenose dolphin population.

2.3 White-beaked dolphin

The estimated density of white-beaked dolphin in the SCANS-IV relevant survey Block NS-D is 0.0799/km^2 (Gilles *et al.,* 2023). The reference population for the Celtic and Greater North Sea (CGNS) MU is 43,951 (IAMMWG, 2023).

The number of white-beaked dolphin that could potentially be disturbed due to the geophysical survey, based on the precautionary disturbance range of 5km, is up to 7 individuals, representing 0.01% of the CGNS MU based on the precautionary disturbance range of 5km (78.54km^2). Based on the maximum daily disturbance footprint of 256km^2, up to 21 individuals, or 0.05% of the CGNS MU population could disturbed. There is therefore a negligible risk of disturbance to the white-beaked dolphin population.

2.4 Common dolphin

The estimated density of common dolphin in the relevant survey area is 0.006/km^2 (Waggitt *et al.,* 2019) and the reference population for the CGNS MU is 102,656 (IAMMWG, 2023).

The number of common dolphin that could potentially be disturbed due to the geophysical survey, based on the precautionary disturbance range of 5km (78.54km^2), is up to 0.4 individuals, representing 0.0005% of the CGNS MU. Based on the maximum daily disturbance footprint of 256km^2, up to 2 individuals, or 0.001% of the CGNS MU population could disturbed. There is therefore a negligible risk of disturbance to the common dolphin population.

2.5 Minke Whale

The estimated density of minke whale in the SCANS-IV relevant survey Block NS-D is 0.0419/km^2 (Gilles *et al*., 2023). The reference population for the CGNS MU is 20,118 (IAMMWG, 2023).

The number of minke whale that could potentially be disturbed due to the geophysical survey, based on the precautionary disturbance range of 5km (78.54km^2), is up to 4 individuals, representing 0.02% of the CGNS MU. Based on the maximum daily disturbance footprint of 256km^2, up to 11 individuals, or 0.05% of the CGNS MU population could disturbed. There is therefore a negligible risk of disturbance to the minke whale population.

3 Mitigation strategy

As the survey equipment to be used has a frequency of below 100kHz and an amplitude of above 210 SPL-peak dB re 1 µPa (unweighted), then the following mitigation measures, as outlined in the JNCC guidelines (JNCC, 2017), will be implemented:

- The survey will not take place between June and August (inclusive) to avoid the harbour seal *Phoca vitulina* breeding and/or pupping period.
- The survey equipment used will use the lowest practical noise levels.
- Due to the surveys location in relation to a designated site for harbour seal, a dedicated Marine Mammal Observer (MMO) will undertake the mitigation. A dedicated MMO refers to a JNCC trained MMO whose sole purpose is to undertake mitigation.
- A pre-survey search of the mitigation zone (of 500m from the acoustic source) will be undertaken prior to the geophysical survey commencement, for a period of at least 30 minutes, by an MMO (pre-survey searches only to be undertaken in daylight and in good visibility).
    - For ROVs, there is the possibility for the ROV to be launched from the shore; therefore, if the ROV is deployed at shore the mitigation watch shall commence from the shore. The mitigation watch must be conducted before the activation of the SBP.
- If a marine mammal is sighted within the 500m mitigation zone during the pre-survey search, the survey commencement will be delayed until the mitigation zone has been clear of marine mammals for a period of at least 20 minutes, and the pre-survey search has been completed.
- A soft-start procedure will be undertaken (wherever practical) once the mitigation zone has been clear for 20 minutes, and the pre-survey search has been completed, with a gradual and consistent ramp-up of power over a minimum 15-minute period, and the line must be commenced within 25 minutes of the start of the soft-start procedure. Once soft-start has commenced, there is no requirement to stop or delay the acoustic survey.
    - For ROVs, once the pre-survey search has been completed the ROV can exit the 500m mitigation zone and soft start procedures can commence and follow the same procedures as described above.

- If a line change is expected to take more than 40 minutes, the geophysical survey will be halted at the end of the survey line, and a full pre-survey search and soft-start procedure will begin prior to the next line.
- If a line change is expected to take less than 40 minutes, surveys can continue if the shot point interval is increased to a maximum of five minutes and is decreased gradually in the final 10 minutes of the line change.
- If several survey equipment are to be started sequentially, or interchanged during the operation, only one pre-shooting search is required prior to commencement of the first acoustic output, and only if there are no gaps in data acquisition of more than 10 minutes.

In addition to above measures designed for marine mammals, the following biosecurity measures will be implemented:

- All staff working on the project will be made aware of the potential presence of invasive non-native species (INNS), as well as how to report any non-native species found on site.
- All equipment used during the surveys will go through a clean, check and dry protocol when used.
- A designated person to be responsible for maintaining a record of any non-native species, and reporting the presence of marine INNS.
    - All non-native species will be reported on iRecord.
- If mINNS are found within the project activity footprint, the results of surveys will be shared with NatureScot (ENQUIRIES@Nature.scot) and the Marine Directorate (MarineNonNativeSpecies@gov.scot).

4 Consideration of cumulative impacts

The activities and projects presented in **Table 4.1** have been identified and considered for potential cumulative impacts with the proposed geophysical survey. For wide ranging species, it is important to consider projects over a wide area. For cetaceans, projects are considered if they are located within the Firth of Tay or elsewhere around the southeast coast of Scotland.

Table 4.1 Potential for cumulative impacts

Project	Location (approx. distance from the geophysical survey)	Activity type	Date of Activity
Port of Dundee Quay Improvement works	0km	Piling works	23/01/2026 – 13/04/2026
Seagreen Offshore Wind Farm (OWF)	6km	Operation and maintenance activities such as ad-hoc surveys	01/01/2024 – 31/12/2026
Seagreen OWF export cable corridor	6km	Removal of infrastructure	05/09/2025 – 04/09/2026
Scottish Hydro Electric Transmission Plc	73km	Geophysical, benthic and geotechnical surveys	19/12/2025 – 26/06/2030
St Andrews harbour	14km	Construction, alteration or improvement of any works	10/10/2025 – 31/01/2027
Bowdun OWF	50km	Geophysical surveys	10/12/2025 – 30/11/2026
Inch Cape OWF	48km	Construction of offshore generating station	15/12/2025 – 31/12/2027
Inch Cape OWF	24.5km	UXO clearance	31/08/2025 - 31/12/2027

Project	Location (approx. distance from the geophysical survey)	Activity type	Date of Activity
Inch Cape OWF	57km	Cofferdam	23/05/2024 – 02/12/2026
Inch Cape OWF	65km	Landfall works	01/01/2025 – 31/12/2028

The Review of Consents document (BEIS, 2020) considered the potential for in-combination effects for geophysical surveys and concluded that, due to the very low PTS onset impact range, there is no potential for a cumulative effect of geophysical surveys being undertaken at the same time as OWF construction (BEIS, 2020).

Similarly, while the potential disturbance range of geophysical surveys are larger than the PTS range, the use of geophysical survey equipment during piling (either a single event or concurrent) was not considered to significantly increase the area of potential disturbance, and the area disturbed would be temporary due to the continual movement of the survey vessel. Therefore, it was concluded that there would be no adverse effect from the cumulative effects of geophysical surveys being undertaken at the same time as an offshore wind farm piling event (BEIS, 2020).

Due to the distance of the other construction activities at other projects and small impact ranges from the proposed geophysical survey, no cumulative impacts are expected to arise. For the potential activities at Seagreen OWF, the project applied a 1km disturbance radius for their activities. Therefore, considering the small range and short-term nature of the works, there is no anticipated adverse cumulative impact (Seagreen Wind Energy Limited, 2023). For the potential UXO clearance at Inch Cape OWF, low order clearance methods will be used in the first instance and the project have their own full mitigation procedures in place (Inch Cape Offshore Limited, 2024); therefore, as the proposed geophysical survey impacts are limited to the local vicinity and Inch Cape OWF have their own mitigation procedures, there is no anticipated adverse cumulative impact.

Given the very short and temporary nature of the geophysical survey and the adherence to the recommended mitigation measures, no cumulative impacts are expected to arise that would affect the conservation status of any EPS.

5 Assessment of potential offence

Following the Marine Scotland guidance (2020), it can be concluded that, with the mitigation measures set out in **Section 3** in place, and with functioning positioning equipment, potential impacts of the proposed geophysical survey are unlikely to result in the harassment, disturbance, injury or killing of an EPS.

In relation to regulation 39(2) of the Habitats Regulations, the percentage of the reference population of EPS that may be disturbed by during the survey is considered to be negligible (less than 1% for all EPS which occur in the area) and therefore not detrimental to the maintenance of the population of the species concerned. Any disturbance would be localised and short-term, and with mitigation is considered to be negligible. Disturbance will not be sufficient to cause population level effects, and thus it is proposed that a Marine EPS licence (to disturb) can be issued under regulation 39 of the Habitats Regulations.

5.1 EPS tests

The purpose of this EPS RA is to determine whether, when considering appropriate mitigation as presented in **Section 3**, there is still potential for the survey activities to cause deliberate harm, or inadvertently cause disturbance to EPS. The need for a Marine EPS Licence will be determined by MD-LOT, with advice from

NatureScot, based on findings from this EPS RA. MD-LOT's consideration of whether an EPS Licence can be granted will comprise the following three tests.

5.1.1 Test 1: The licence must relate to one of the purposes referred to in Regulation 44(2).

The Scottish Government can only issue licenses under Regulation 44(2) of the Regulations (as amended) for specific purposes. These purposes include:

- 44(2)(e) preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.

Offshore wind is a key growth sector in Scotland, and the generation and development of offshore wind infrastructure is a key component for reaching Scotland's target to reduce greenhouse gas emissions (by 75% by 2030), and for being net-zero by 2045. Part of the next round of offshore wind development in Scotland (currently being bid for through the ScotWind process) is to ensure that 25% of the offshore wind industry is provided by local business.

One of the primary uses for the Port of Dundee is the service and support of the offshore renewables industry. The Port of Dundee is improving various aspects of the Port of Dundee to support the industry. The port provides facilities for the transhipment and storage of components such as all WTGs and other parts associated with wind farm projects. Due to the increasing size water depth required by vessels used by the offshore renewables industry, the Port of Dundee Limited is proposing to undertake a suite of works at the Port of Dundee and to the Lady Shoal approach channel.

5.1.2 Test 2: There must be no satisfactory alternative (Regulation 44(3a)).

A geophysical survey of the capital dredge footprint is required to identify potential UXO risk to ensure a safe dredging project. It is important to note:

- Survey Location, Duration and Extent: the smallest survey area possible has been proposed. The smallest number of survey lines within this area and minimum survey duration possible has been determined. Reducing the size of the survey area and / or the number of survey lines any further would provide insufficient data.
- Survey Equipment / Methodology: the geophysical survey will provide the most efficient dataset that can be used to assess potential environmental impacts. The design of the survey and use of ROVs considers the provision of the required data but without survey techniques which may be superfluous for the current objectives. Overall, the methodology will meet the objectives of the survey with the minimal practicable impact to EPS.

As it is not possible to undertake surveys without some potential disturbance to EPS, measures that will be taken to reduce potential risks include the mitigation strategies as set out in **Section 3**. Thus, the Port of Dundee considers that the 'no satisfactory alternative test' has been met.

5.1.3 Test 3: The action authorised must not be detrimental to the maintenance of the population of the species concerned at FCS in their natural range (Regulation 44(3b)).

The percentage of the reference population of EPS that may experience disturbance would be negligible for in all cases (i.e. less than 1% of the reference population impacted). As such, disturbance during the survey is not considered detrimental to the maintenance of the populations or achievement of FCS.

6 Conclusions

The proposed dredging is an important part of the Port of Dundee Limited's aspirations to continue supporting Scotland's growing contributions to the UK's renewable energy sector. A geophysical survey of the capital dredge footprint is required to provide information on the potential for encountering UXO in order to ensure a safe dredging project.

It is possible that a small number of individuals may experience negligible disturbance for during the period in which they may encounter noise emissions from survey operations. Given the very short-term impacts (likely no more than four weeks), it is considered that there is no potential for significant impact on the wider populations of EPS, including harbour porpoise, bottlenose dolphin, white-beaked dolphin, common dolphin and minke whale.

Based on other current and future activities, along with the potential mitigation that will be in place during the proposed survey, the level of cumulative disturbance is predicted to be low. As the potential impacts arising from disturbance from each activity will be temporary, there will be no impact on the FCS of any EPS.

Disturbance therefore will not be sufficient to cause any population level effects, and thus it is considered that a Marine EPS Licence to disturb can be issued.

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