

Shannon Foynes Port Company

Natura Impact Statement

Foynes Island: Additional Marine Site Investigations (Areas C & D)

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1 INTRODUCTION

This Supporting Information for Screening for Appropriate Assessment (SISAA) and Natura Impact Statement (NIS) has been prepared by Tetra Tech on behalf of Shannon Foynes Port Company (SFPC). This report is intended to assist the Maritime Area Regulatory Authority (MARA) in fulfilling its role as a Competent Authority in relation to conducting an appropriate assessment of the site investigations proposed as an amendment to an existing Maritime Usage Licence (MUL) (Ref: LIC230014) for Marine Site Investigations awarded to SFPC by MARA on 24th October 2024.

This report has been prepared to accompany an application for the amendment to MUL (Ref: LIC230014) awarded to SFPC and is an examination of whether, in view of best scientific knowledge and applying the precautionary principle, the proposed additional Marine SI works, either individually or in combination with other plans or projects, may adversely affect the integrity of any European site(s).

1.1 Appropriate Assessment

With the introduction of the Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) came the obligation to establish the Natura 2000 network of Sites of Community Interest (SCIs), comprising a network of areas of highest biodiversity importance for rare and threatened habitats and species across the European Union (EU).

The Natura 2000 network of sites comprises Special Areas of Conservation (SACs, including candidate SACs or cSACs) designated under legislation transposing the obligations under Directive 92/43/EEC, and Special Protection Areas (SPAs, including proposed SPAs) classified under the Birds Directive (Directive 2009/147/EC on the conservation of wild birds) and designated under Irish legislation. SACs and SPAs make up the pan-European network of Natura 2000 sites in Ireland and they are referred to as European sites.

In this report, cSACs and SACs are referred to as SACs throughout the appraisal, and there is no distinction made between candidate sites and designated sites as the appropriate assessment procedure does not treat them differently. For the purposes of an appropriate assessment conducted under 2011 Regulations, they are one and the same.

SACs are designated for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are designated for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is designated correspond to the Qualifying Interests (QIs) of the sites in the case of SACs, and Special Conservation Interests (SCIs) of the sites in the case of SPAs. From these qualifying interests, the Conservation Objectives (COs) of the site are derived.

1.1.1 The Habitats Directive

Article 6(3) of the Habitats Directive requires that—

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and if appropriate, after having obtained the opinion of the general public.

1.1.2 Domestic Legislation

For the purposes of applications for planning permission, Part XAB of the 2000 Act implemented the obligations under Article 6(3) into Irish law. In relation to other consent regimes, the provisions of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended (“the 2011 Regulations”), transpose those obligations.

This report has been prepared in support of an application for an amendment to an existing MUL (Ref: LIC230014) awarded under the Maritime Area Planning Act 2021, as amended (“MAPA”), and so the provisions of the 2011 Regulations are applicable.

1.1.2.1 Screening

Regulation 42 of the 2011 Regulations requires inter alia that screening for appropriate assessment of a project, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.

Screening for appropriate assessment is not further defined in the Maritime Area Planning Act 2021, as amended (“MAPA”), with its meaning being cross-referred back to the 2000 Act and the 2011 Regulations. Section 117(4) of the MAPA requires that MARA shall, as soon as is practicable after it receives a licence application, and if it considers it necessary to do so in its capacity as the competent authority, carry out screening for appropriate assessment in respect of the proposed maritime usage the subject of a MUL application.

1.1.2.2 Appropriate Assessment

Regulation 42 of the 2011 Regulations requires inter alia that a public authority shall determine that an appropriate assessment of a project is required where the project is not directly connected with or necessary to the management of the site as a European Site and if it cannot be excluded, on the basis of objective scientific information following screening, that the project, individually or in combination with other plans or projects, will have a significant effect on a European site.

Section 117(6) of the MAPA requires MARA, in circumstances where an appropriate assessment is required, to seek a Natura Impact Statement from the MUL applicant and consult the public on it before carrying out an appropriate assessment.

1.1.3 The Appropriate Assessment Process

According to European Commission guidance documents ‘Assessment of plans and projects in relation to Natura 2000 sites’ (EC, 2021); ‘Guidance document on wind energy developments and EU nature legislation’ (EC, 2020); and ‘Managing Natura 2000 sites: The Provisions of Article 6 of the ‘Habitats’ Directive 92/43/EEC’ (EC, 2019); the obligations arising under Article 6 establish a step-wise procedure as illustrated in **Figure 1-1**. We note that the flowchart illustrated in **Figure 1-1** is taken directly from Figure 1 of EC (2021). It is also noted that while this flowchart states in the ‘Appropriate Assessment’ stage (the dark blue step) “Is it ascertained that [having applied the necessary mitigation measures and consulted the public] the plan or project will not have **significant effect** [with other plans or projects] on the integrity of the Natura 2000 site in view of its conservation objectives?” (emphasis added), the applicable test at the Appropriate Assessment stage, in accordance with Article 6(3) of the Habitats Directive, is whether or not the plan or project will have an **adverse effect** the integrity of any European site (as referred to above).

The first part of this procedure consists of a pre-assessment stage ('screening') to determine whether, firstly, a plan or project is directly connected with or necessary to the management of the site, and secondly, whether it is likely to have a significant effect on the site; it is governed by Article 6(3), first sentence.

The second part of the procedure, governed by Article 6(3), second sentence, relates to the appropriate assessment and the decision of the competent national authorities.

A third part of the procedure (governed by Article 6(4)) comes into play if, despite adverse effects on the integrity of the site concerned, it is proposed not to reject a plan or project but to give it further consideration. In this case Article 6(4) allows for derogations from Article 6(3) under certain conditions.

The extent to which the sequential steps of Article 6(3) apply to a given plan or project depends on several factors, and in the sequence of steps, each step is influenced by the previous step. The order in which the steps are followed is therefore essential for the correct application of Article 6(3).

Each step determines whether a further step in the process is required. If, for example, the conclusion at the end of a Habitats Directive stage one screening appraisal is that significant effects on European sites can be excluded in the absence of any best practice or targeted measures intended to avoid or reduce the harmful effects of the proposed surveys on European sites, there is no requirement to proceed to the next step.

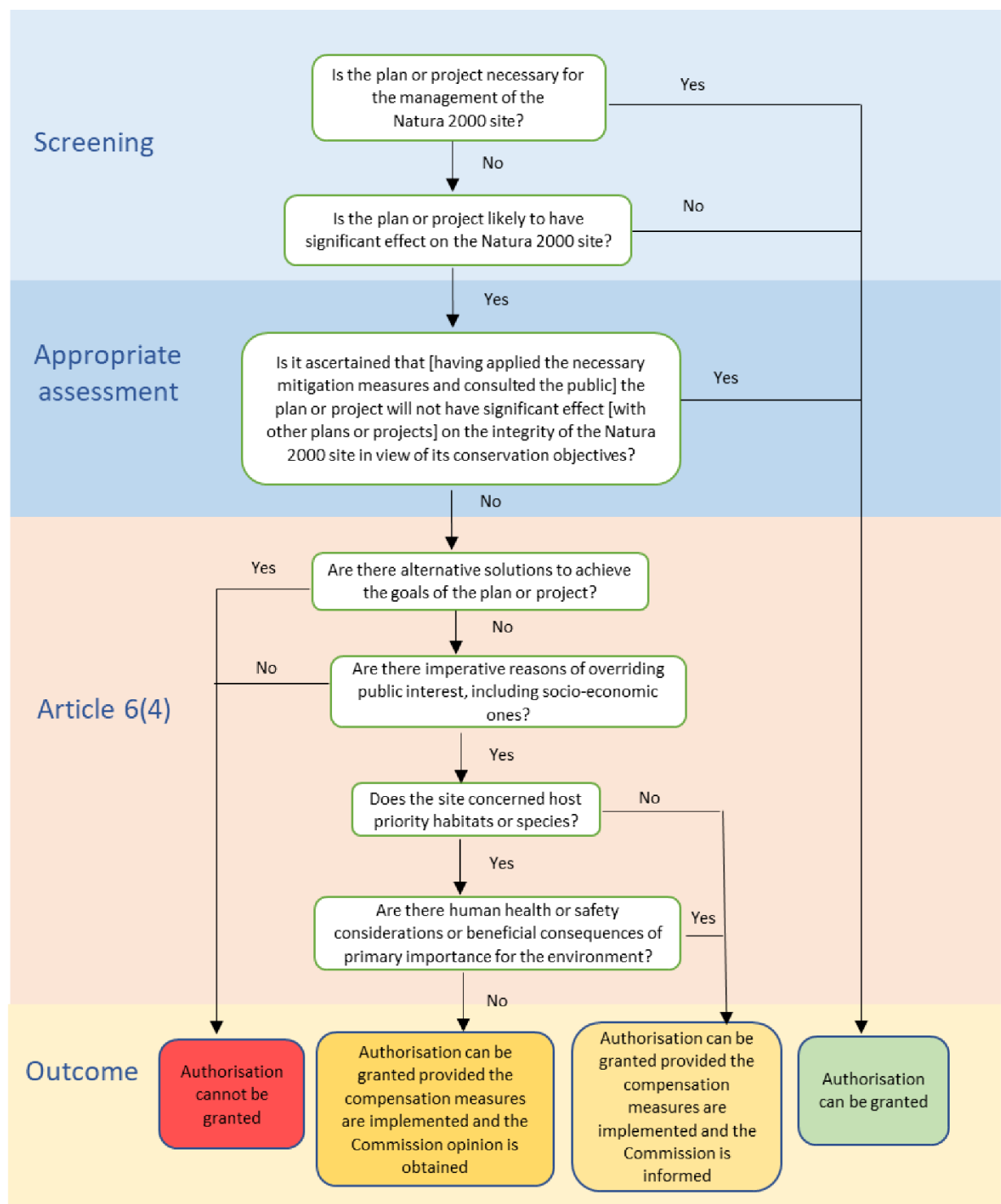


Figure 1-1: Step-wise procedure of Article 6 of the Habitats Directive (from EC, 2021)

1.2 Document Structure

1.2.1 Objective of the Document

The purpose of this document is to provide the competent authority with information to assist them in carrying out an assessment of the implications of the proposed additional marine site investigation works, for which an amendment to the existing MUL (Ref: LIC230014) is being sought, as part of the proposed Foynes Island Deepwater Development on European sites in view of their conservation objectives.

This exercise has been conducted on behalf of SFPC in support of an application to MARA for an amendment to MUL (Ref: LIC230014).

This report seeks to assist MARA as public authorities under the 2011 Regulations in fulfilling their obligations to conduct an appropriate assessment.

1.2.2 Methodology and Guidance

Section 2 of the report sets out the methodology followed, and guidance documents used in conducting a screening appraisal for appropriate assessment and subsequent appraisal for appropriate assessment of the implications of the Proposed Development on European sites.

1.2.3 Proposed Development

Section 3 of the report describes the Proposed Development, the general methodology sequence and activities to be undertaken.

1.2.4 Stage 2 Appropriate Assessment

Section 4 of the report contains the findings of the AA screening assessment and more detailed examination and analysis of the implications of the Proposed Development on the Conservation Objectives of those European sites where the possibility of Likely Significant Effects (LSEs) could not be excluded at the screening stage in the absence of further evaluation and analysis, including mitigation measures.

2 METHODOLOGY

2.1 Published guidance on Appropriate Assessment

Appropriate Assessment Guidelines for Planning Authorities have been published by the Department of the Environment Heritage and Local Government ([DEHLG, 2010a](#)) and more recently by the Office of the Planning Regulator Practice Note (PN01) ([OPR, 2021](#)). In addition to the advice available from the Department, the European Commission has published a number of documents which provide a significant body of guidance on the requirements of Appropriate Assessment, most notably including Notice C(2021) 6913 '*Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC*', which sets out the principles of how to approach decision making during the process. These principal national and European guidelines have been followed in the preparation of this NIS report. The following list identifies these and other pertinent guidance documents:

- Communication from the Commission on the Precautionary Principle., Office for Official Publications of the European Communities, Luxembourg (EC, 2000);
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Luxembourg (EC, 2001);
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission. Office for Official Publications of the European Communities, Luxembourg (EC, 2007);
- Estuaries and Coastal Zones within the Context of the Birds and Habitats Directives - Technical Supporting Document on their Dual Roles as Natura 2000 Sites and as Waterways and Locations for Ports. Office for Official Publications of the European Communities, Luxembourg (EC, 2009);
- Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, Dublin (DEHLG, 2010a);
- Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities, Dublin (DEHLG, 2010b);
- Guidance document on the implementation of the birds and habitats directive in estuaries and coastal zones with particular attention to port development and dredging. Office for Official Publications of the European Communities, Luxembourg (EC, 2011a);
- European Commission Staff Working Document 'Integrating biodiversity and nature protection into port development', Office for Official Publications of the European Communities, Luxembourg (EC, 2011b);
- European Commission Note on Setting Conservation Objectives for Natura 2000 Sites, Office for Official Publications of the European Communities, Luxembourg (EC, 2012);
- Marine Natura Impact Statements in Irish Special Areas of Conservation: A working document, National Parks and Wildlife Service, Dublin (NPWS, 2012);
- Interpretation Manual of European Union Habitats. Version EUR 28. Office for Official Publications of the European Communities, Luxembourg (EC, 2013a);

- Guidelines on Climate Change and Natura 2000. Office for Official Publications of the European Communities, Luxembourg (EC, 2013b);
- Guidance on EIS and NIS Preparation for Offshore Renewable Energy Projects. Department of Communications, Climate Action and Environment, Dublin (DCCAE, 2017);
- European Commission Notice C(2018) 7621 'Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC', Office for Official Publications of the European Communities, Luxembourg (EC, 2019);
- Institute of Air Quality Management 'A guide to the assessment of air quality impacts on designated nature conservation sites (Version 1.1)', London (IAQM, 2020);
- European Commission Notice C(2020) 7730 'Guidance document on wind energy developments and EU nature legislation', Office for Official Publications of the European Communities, Luxembourg (EC, 2020);
- Office of the Planning Regulator Practice Note (PN01) 'Appropriate Assessment Screening for Development Management', Dublin (OPR, 2021);
- European Commission Notice C (2021) 6913 'Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC', Office for Official Publications of the European Communities, Luxembourg (EC, 2021); and
- European Commission Guidance document on Assessment of plans and projects in relation to Natura 2000 sites - A summary, Office for Official Publications of the European Communities, Luxembourg (EC, 2022).

2.2 Likely Significant Effect

The Commission's 2018 Notice (EC, 2019) advises that the appropriate assessment procedure under Article 6(3) is triggered not by the certainty but by the likelihood of significant effects, arising from plans or projects regardless of their location inside or outside a protected site. Such likelihood exists if significant effects on the site cannot be excluded. The significance of effects should be determined in relation to the specific features and environmental conditions of the site concerned by the plan or project, taking particular account of the site's conservation objectives and ecological characteristics.

The threshold for a Likely Significant Effect ("LSE") is treated in the screening exercise as being above a *de minimis* level. A *de minimis* effect is a level of risk that is too small to be concerned with when considering ecological requirements of an Annex I habitat or a population of Annex II species present in a European site necessary to ensure their favourable conservation condition. If low level effects on habitats or individuals of species are judged to be in this order of magnitude and that judgment has been made in the absence of reasonable scientific doubt, then those effects are not considered to be LSEs.

The analysis involved in a Stage 1 screening appraisal for Appropriate Assessment is described in EC (2021) as comprising four steps:

- ascertaining whether the plan or project is directly connected with or necessary to the management of a Natura 2000 site;
- identifying the relevant elements of the plan or project and their likely impacts;
- identifying which (if any) Natura 2000 sites may be affected, considering the potential effects of the plan or project alone or in combination with other plans or projects;
- assessing whether likely significant effects on the Natura 2000 site can be ruled out, in view of the site's conservation objectives.

Case law of the Court of Justice of the European Union (CJEU) has confirmed that a significant effect is triggered when:

- there is a probability or a risk of a plan or project having a significant effect on a European site;
- the plan is likely to undermine the site's conservation objectives; and
- a significant effect cannot be excluded on the basis of objective information.

EC (2021) defines an LSE as being “any effect that may reasonably be predicted as a consequence of a plan or project that would negatively and significantly affect the conservation objectives established for the habitats and species significantly present on the Natura 2000 site. This can result from either on-site or off-site activities, or through combinations with other plans or projects”.

The requirement that the effect in question be ‘significant’ exists in order to lay down a *de minimis* or negligible threshold – thus, plans or projects that have imperceptible or no appreciable effects on the site are thereby excluded.

2.3 Mitigation Measures

In determining whether or not likely significant effects will occur or can be excluded in the Stage 1 appraisal, measures intended to avoid or reduce the harmful effects of the Proposed Development on European sites, (i.e. “mitigation measures”) or best practice measures have not been taken into account in this screening stage appraisal. This approach is consistent with up-to-date EU guidance (EU, 2019; EC, 2021; EC, 2022) and the case law of the Court of Justice of the European Union (CJEU).

EC (2001) states that “project and plan proponents are often encouraged to design mitigation measures into their proposals at the outset. However, it is important to recognise that the screening assessment should be carried out in the absence of any consideration of mitigation measures that form part of a project or plan and are designed to avoid or reduce the impact of a project or plan on a Natura 2000 site”. This direction in the European Commission’s guidance document is unambiguous in that it does not permit the inclusion of mitigation at screening stage.

In April 2018, the Court of Justice of the European Union issued a ruling in case C-323/17 *People Over Wind & Peter Sweetman v Coillte Teoranta* (“People Over Wind”) that Article 6(3) of Directive 92/43/EEC must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site.

The judgment in *People Over Wind* is reaffirmed in up-to-date EC guidance documents which refers to CJEU Case C-323/17.

More recently, the decision of the CJEU in case C-721/21 (*Eco Advocacy CLG v An Bord Pleanála*), delivered in June 2023, found that Article 6(3) of Directive 92/43 must be interpreted as meaning that:

“in order to determine whether it is necessary to carry out an appropriate assessment of the implications of a plan or project for a site, account may be taken of the features of that plan or project which involve the removal of contaminants and which therefore may have the effect of reducing the harmful effects of the plan or project on that site, where those features have been incorporated into that plan or project as standard features, inherent in such a plan or project, irrespective of any effect on the site.” (Para. 53(3) of the Judgement).

This recent judgement therefore clarifies that features which have been incorporated into a project as standard features, inherent in that project, and irrespective of any effect on any European site may be taken

into account for the purposes of a Stage 1 Screening for Appropriate Assessment under Article 6(3) of the Directive.

Measures intended to avoid or reduce the harmful effects of the Project on European sites have not been considered at the screening stage of the assessment (see previously submitted Foynes Island Marine SI SISAA Report).

2.4 Consideration of *ex-situ* effects

EC (2019) advises that Member States, both in their legislation and in their practice, allow for the Article 6(3) safeguards to be applied to any development pressures, including those which are external to European sites but which are likely to have significant effects on any of them.

The CJEU developed this point when it issued a ruling in case C-461/17 (“Brian Holohan and Others v An Bord Pleanála”) that determined *inter alia* that Article 6(3) of Directive 92/43/EEC must be interpreted as meaning that an appropriate assessment must on the one hand, catalogue the entirety of habitat types and species for which a site is protected, and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that those implications are liable to affect the conservation objectives of the site.

In that regard, consideration has been given in this Habitats Directive appraisal to implications for habitats and species located both inside and outside of the European sites considered in the screening appraisal with reference to those sites’ Conservation Objectives where effects upon those habitats and/or species are liable to affect the conservation objectives of the sites concerned.

2.5 Conservation Objectives

The conservation objectives for each European site are to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the site has been selected. The favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing;
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- the conservation status of its typical species is favourable.

The favourable conservation status (or condition, at a site level) of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

EC (2022) advises that an assessment should be done for all of the designating features (species, habitat types) that are significantly present on the site (habitats and species with A, B or C, but not D, site assessment in the Standard Data Form for the site) in view of their conservation objectives. EC (2022) additionally notes that “*the lack of site-specific conservation objectives or the establishment of conservation objectives, which are not in line with the required standard, as specified in the Commission note on “Setting*

conservation objectives of Natura 2000 sites” (EC, 2012), jeopardises compliance with the requirements of Article 6(3)”.

2.5.1 Site-Specific Conservation Objectives

NPWS began preparing detailed Site-Specific Conservation Objectives (SSCOs) for European sites in 2011. The European sites within closest proximity to the Proposed Development which are considered in some detail in this NIS report have all had SSCO set. The published SSCO documents note that an appropriate assessment based on the most up to date conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.

The most up-to-date Conservation Objectives for the European sites being considered, and details in relation to the Qualifying Interests and Special Conservation Interests of these European sites is based on publicly available data on these European Sites, sourced from the [NPWS website](#) in July 2026.

2.6 In-combination Effects

Article 6(3) of the Habitats Directive requires that in-combination effects with other plans or projects are also considered. As set out in the Commission’s 2018 Notice (EC, 2019), significance will vary depending on factors such as magnitude of impact, type, extent, duration, intensity, timing, probability, cumulative effects and the vulnerability of the habitats and species concerned. Whilst the Directive does not explicitly define which other plans and projects are within the scope of the in-combination provision of Article 6(3), it is important to note that the underlying intention of this provision is to take account of cumulative impacts, and these will often only occur over time.

In that context, one can consider plans or projects which are completed, approved but uncompleted, or proposed. EC (2019) specifically advises [on p43] that *“as regards other proposed plans or projects, on grounds of legal certainty it would seem appropriate to restrict the in-combination provision to those which have been actually proposed, i.e. for which an application for approval or consent has been introduced”*.

3 THE PROPOSED DEVELOPMENT

3.1 Wider Context

The proposed development comprises marine site investigation (SI) works within two areas surrounding Foynes Island, Foynes, Co. Limerick. The site boundary of the works is illustrated in Figure 3-1. Consent for these marine site investigations is being sought under an amendment to the existing Maritime Usage Licence (LIC230014) issued by MARA in October 2024.

The scale of the SI works is commensurate with the level of detail required to facilitate the preliminary and detailed design and environmental assessment of the proposed Foynes Island Deepwater Development ("FIDD") Project for development consent applications.

The quantity of boreholes required is based on the requirement for the following infrastructure within the wider port development proposals:

- 700m long open pile quay structure;
- Development of port operations behind the full length of the quay structure;
- Potential enhancement works at Foynes Yacht Club as part of potential community gain proposals.

Boreholes/assumed depths may be refined further by site surveys, subsequent design changes and requirements arising as a result of the environmental assessment.

3.2 Marine Geophysical Survey

A marine geophysical survey will be carried out and will cover the full area of the development footprint under water (where accessible). The aims of the survey are to:

- Identify and map potential geohazards;
- Identify and map potential archaeological sites and features;
- Facilitate the development of a ground model in support of the wider design; and
- Provide data and information in support of option development and Environmental Impact Assessment.
- A range of instruments will be deployed for this survey including:
 - GNSS positioning;
 - Motion Reference Unit;
 - Multibeam Echosounder;
 - Sound Velocity Profiler;
 - Sub-bottom Profiler, chirp;
 - Side-scan Sonar, dual frequency, low and high;
 - Magnetometer, caesium;
 - Navigation, acquisition and processing suite;
 - Post-processing navigation suite; and
 - Charting software.

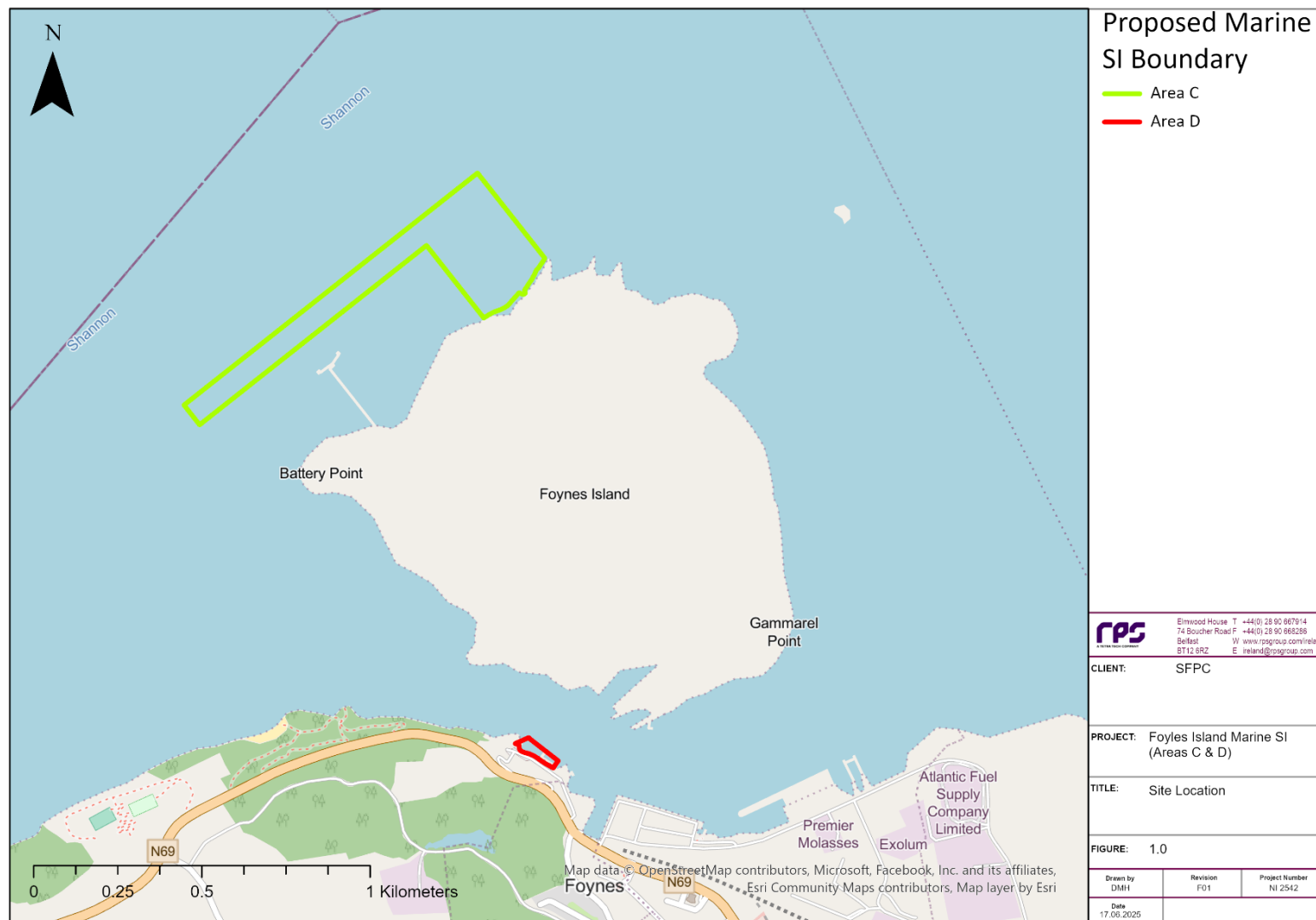


Figure 3-1: Location of the proposed Marine SI Works

The survey will be undertaken by a competent and experienced marine hydrographer and will use a Department of Marine licenced survey vessel capable of accessing all survey areas at high water. Main lines will be spaced at 20m apart in shallow waters, increasing to 50m spacing in deeper water. Cross lines will be spaced at 200m apart. Additional infill lines in shallow areas may be required to allow for full device-suite coverage at 100% and greater, thus ensuring there are no data gaps.

3.3 Marine Site Investigations

Proposed marine SI works include the following main components over 2 separate sites, C and D.

Site C

- 6nr. Boreholes
- 20nr. Grab Sample Locations and 1nr vibrocore

Site D

- 1nr. Boreholes
- 3nr. Grab Sample Locations

3.3.1 Boreholes

The proposed borehole locations are illustrated at Figure 3-2. Boreholes will consist of cable percussion drilling through soft estuarine overburden, with follow-on rotary coring for recovery of firm granular/till material and bedrock.

The boreholes are to be drilled firstly using cable percussive techniques. If rock is to be penetrated, then rotary drilling will follow on. The machinery to be used is approximately 2m tall when it is in transit and approximately 7m tall when the borehole is being driven. The machinery will be supported by a suitable jack-up barge. A typical jack-up barge arrangement will be similar to that shown in Figure 3-3.

For each borehole the footprint of the works on the foreshore will be four approximately 1 m² legs of the jack-up barge and the 200mm (8") temporary steel casing. The 200mm steel casing is the diameter of the borehole.

There will be no permanent structures, all site investigation will be facilitated by temporary works. The moving marine plant will remain on site for the duration of the works.

Associated sampling and testing (both in-situ and geotechnical/geo-environmental laboratory testing) is required.

Proposed marine SI works will not require access to Foynes Island itself and will be conducted entirely from vessels within the marine environment.

3.3.2 Surface Grab Sample and Vibrocore

It is proposed to collect surface grab samples from 20 locations within Area C. It is expected that 18 of the surface grab sample locations and the vibrocore will occur in the subtidal area, and 2 surface grab samples will occur in the intertidal area. An additional 3 grab samples will be collected in Area D, all subtidal. In addition, a subtidal reef habitat has been identified along the centre of the main Shannon channel which is immediately adjacent to the development. It is expected that drop down video locations will be surveyed within and adjacent to this reef community. A walkover survey will be undertaken on the hard-benthos intertidal areas within and immediately adjacent to the footprint of the hardstand area.

Subtidal sampling will involve the following:

- Single 0.1m² grab samples collected at each of the subtidal sampling stations;
- Single vibrocore collected in Area A to a depth of 2m and diameter of approximately 75mm
- An additional grab will be collected for Grainsize and Loss on Ignition;
- Ancillary information will be recorded on pre-prepared data record sheets;
- Samples will be positioned using the vessel's GPS. Sample positions will be recorded when on site;
- Photographs will be taken of each sample; and
- Drop down video footage will be collected from circa 5-10 locations within and adjacent to an extensive reef area located within Lower Shannon SAC.
- Intertidal sampling will include the following:
 - Single stove-pipe core (0.028m²) will be collected at each intertidal sample station;
 - A surface scrape will be collected at each site;
 - Ancillary information will be recorded on pre-prepared data record sheets;
 - Samples will be positioned using a hand-held GPS. Sample positions will be recorded when on site; and
 - Photographs of the site will be collected at each location.

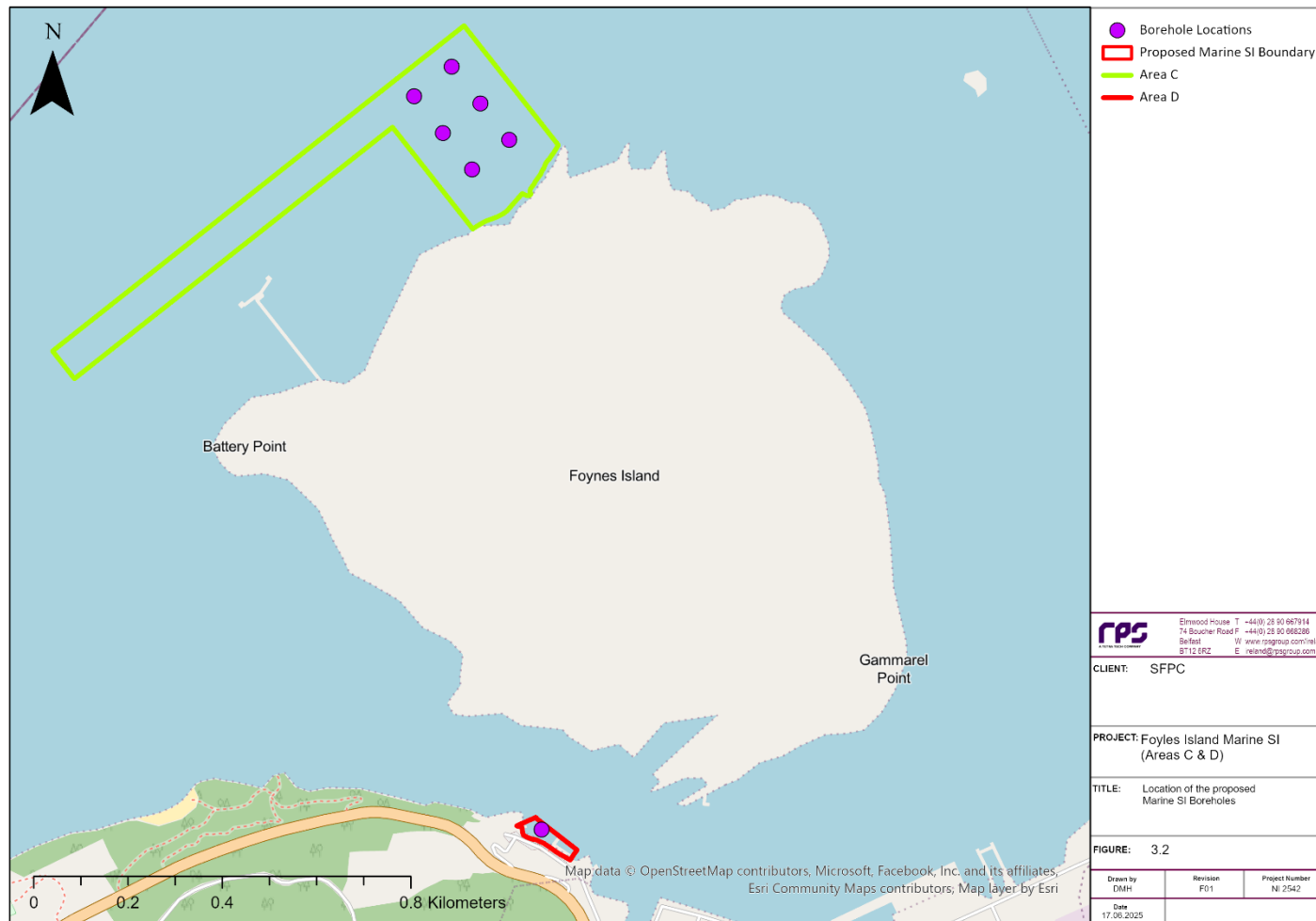


Figure 3-2: Location of the proposed Marine SI Boreholes



Figure 3-3: Typical Jack-up Barge Arrangement for Marine SI Works

4 REPORT TO INFORM SCREENING FOR APPROPRIATE ASSESSMENT

The Applicant's Report to Inform Screening for Appropriate Assessment was completed in compliance with EU and Irish law and the relevant European Commission and national guidelines to determine whether or not Likely Significant Effects on any European site could be excluded as a result of the Proposed Development.

The Proposed Development is not directly connected with or necessary to the management of any European site.

The possibility of significant effects was considered using a source-pathway-receptor model, where 'Source' was defined as the individual elements of the proposed works that have the potential to affect the identified ecological receptors both within the European site and outside of it in accordance with the 'Holohan' judgment (refer Section 2.4 above). 'Pathway' was defined as the means or route by which a source can affect the ecological receptor. 'Ecological receptor' was defined as the Special Conservation Interests (for SPAs) or Qualifying Interests (of SACs) for which conservation objectives have been set for the European sites under consideration. Each element can exist independently however an effect is created when there is a linkage between the source, pathway and receptor.

Possible direct and indirect effects arising as a result of activities undertaken as part of the Proposed Development were discussed under the following themes:

- Direct Effects
 - Habitat loss and alteration ("Habitat Loss")
- Indirect Effects
 - Water quality and habitat deterioration ("Water Quality")
 - Underwater noise and acoustic disturbance or displacement ("Underwater Disturbance")
 - Aerial noise and visual disturbance or displacement ("Aerial Disturbance")

The location of the relevant European Sites, in the context of the Proposed Development boundary, are illustrated in [Figure 4-1](#). Conservation objectives of these sites and the screening decision are detailed within [Table 4-1](#) below.

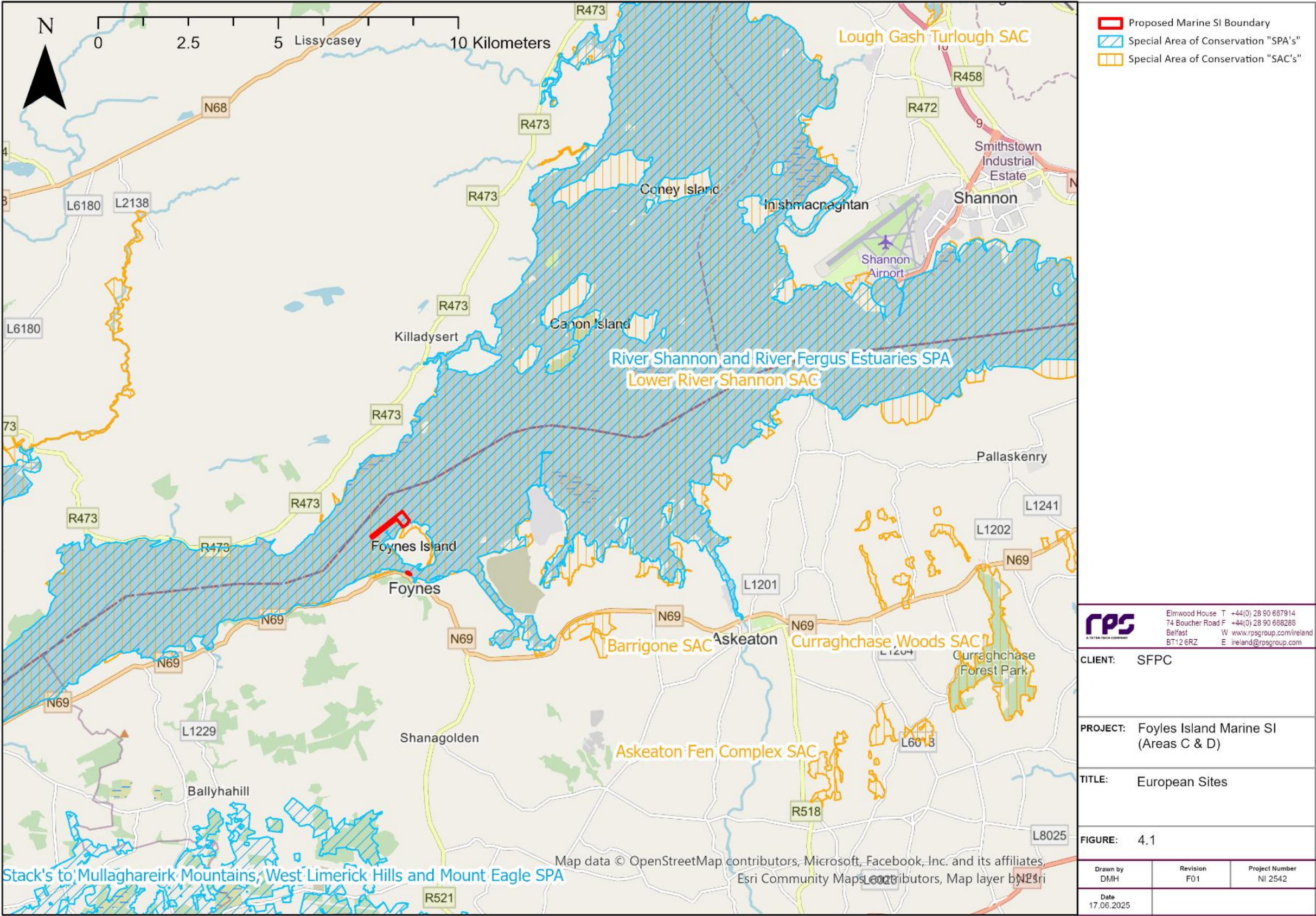


Figure 4-1: European Sites Within Proximity to the Site

Table 4-1: Qualifying Interests and Conservation objectives of European sites considered

European site & site code	Distance from proposed area (km)	List of Qualifying Interests	Connections (Source pathway-receptor)	European Site Screened in
Lower River Shannon SAC [002165]	Within boundary SAC	Sandbanks which are slightly covered by sea water all the time [1110] Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glauco Puccinellietalia maritimae</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0] <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	No	Yes
		Estuaries [1130] Reefs [1170]	Possible physical disturbance and habitat loss Possible water quality / habitat deterioration from pollution incidents (fuel, oils etc.)	
		<i>Petromyzon marinus</i> (Sea Lamprey) [1095] <i>Lampetra planeri</i> (Brook Lamprey) [1096] <i>Lampetra fluviatilis</i> (River Lamprey) [1099] <i>Salmo salar</i> (Salmon) [1106]	Possible increased suspended sediment concentration from geotechnical surveys. Possible disturbance from underwater noise	
		<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]	Possible disturbance from underwater noise Possible impact on prey species from water quality / habitat deterioration from suspended solids	
		<i>Lutra lutra</i> (Otter) [1355]	Possible visual and above water noise disturbance Possible disturbance from underwater noise Possible impact on prey species from water quality / habitat deterioration from suspended solids	
Kerry Head Shoal SAC [002263]	50-75km	Reefs [1170]	No	Yes

European site & site code	Distance from proposed area (km)	List of Qualifying Interests	Connections (Source pathway-receptor)	European Site Screened in
Blasket Islands SAC [002172]	100-150km	Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330]	No	Yes
		<i>Phocoena phocoena</i> (Harbour Porpoise) [1351] <i>Halichoerus grypus</i> (Grey Seal) [1364]	Possible disturbance from underwater noise	
Slyne Head Islands SAC [000328]	100-150km	Reefs [1170]	No	Yes
		<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349] <i>Halichoerus grypus</i> (Grey Seal) [1364]	Possible disturbance from underwater noise	
Slyne Head Peninsula SAC [002074]	100-150km	Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] Machairs (* in Ireland) [21A0] Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoetes Nanojuncetea</i> [3130] Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140] European dry heaths [4030] <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]	No	Yes

European site & site code	Distance from proposed area (km)	List of Qualifying Interests	Connections (Source pathway-receptor)	European Site Screened in
		Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] Alkaline fens [7230] Petalophyllum ralfsii (Petalwort) [1395] <i>Najas flexilis</i> (Slender Naiad) [1833]		
		<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]	Possible disturbance from underwater noise	
West Connacht Coast SAC [002998]	150-200km	<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349] <i>Phocoena phocoena</i> (Harbour Porpoise) [1351]	Possible disturbance from underwater noise	Yes
Duvillaun Islands SAC [000495]	200-250 km	<i>Halichoerus grypus</i> (Grey Seal) [1364]	No	Yes
		<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]	Possible disturbance from underwater noise	
Kenmare River SAC [002158]	150-200km	Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Atlantic salt meadows (Glauco Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] European dry heaths [4030] Juniperus communis formations on heaths or calcareous grasslands [5130] Calaminarian grasslands of the <i>Violetalia calaminariae</i> [6130] Submerged or partially submerged sea caves [8330] <i>Vertigo angustior</i> (Narrow-mouthed Whorl Snail) [1014]	No	Yes

European site & site code	Distance from proposed area (km)	List of Qualifying Interests	Connections (Source pathway-receptor)	European Site Screened in
		<i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303] <i>Lutra lutra</i> (Otter) [1355] <i>Phoca vitulina</i> (Harbour Seal) [1365]		
		<i>Phocoena phocoena</i> (Harbour Porpoise) [1351]	Possible disturbance from underwater noise	
Roaringwater Bay and Islands SAC [000101]	200-250 km	Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330] <i>Lutra lutra</i> (Otter) [1355] <i>Halichoerus grypus</i> (Grey Seal) [1364]	No	Yes
		<i>Phocoena phocoena</i> (Harbour Porpoise) [1351]	Possible disturbance from underwater noise	
River Shannon and River Foynes Estuaries SPA [004077]	Within boundary SPA	Cormorant (<i>Phalacrocorax carbo</i>) [A017] Whooper Swan (<i>Cygnus cygnus</i>) [A038] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Shelduck (<i>Tadorna tadorna</i>) [A048] Wigeon (<i>Anas penelope</i>) [A050] Teal (<i>Anas crecca</i>) [A052] Pintail (<i>Anas acuta</i>) [A054] Shoveler (<i>Anas clypeata</i>) [A056] Scaup (<i>Aythya marila</i>) [A062] Ringed Plover (<i>Charadrius hiaticula</i>) [A137] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Grey Plover (<i>Pluvialis squatarola</i>) [A141] Knot (<i>Calidris canutus</i>) [A143]	Possible visual and above water noise disturbance Possible disturbance from underwater noise Possible impact from water quality / habitat deterioration from pollution incidents (fuel, oils etc.)	Yes

European site & site code	Distance from proposed area (km)	List of Qualifying Interests	Connections (Source pathway-receptor)	European Site Screened in
		Dunlin (<i>Calidris alpina</i>) [A149] Black-tailed Godwit (<i>Limosa limosa</i>) [A156] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Curlew (<i>Numenius arquata</i>) [A160] Redshank (<i>Tringa totanus</i>) [A162] Greenshank (<i>Tringa nebularia</i>) [A164] Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Wetland and Waterbirds [A999]		
Loop Head SPA [004119]	50-100 km	Kittiwake (<i>Rissa tridactyla</i>) [A188] Guillemot (<i>Uria aalge</i>) [A199]	No	No
Kerry Head SPA [Site code 004189]	50-100 km	Fulmar (<i>Fulmarus glacialis</i>) [A009] Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346]	No	No

5 APPRAISAL TO INFORM AN APPROPRIATE ASSESSMENT

5.1.1 Habitat Loss

The proposed additional marine site investigations work area lies within two European sites, namely the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA. The works area does not lie within or in proximity to any other European sites.

The proposed additional Marine SI works will take place within areas of the Lower River Shannon SAC which support the following Annex I habitats:

- Estuaries [1130] – 7 no. Cable percussive boreholes, a single vibrocore and 23 no Benthic grab samples.

The distribution of Annex I habitats within the Lower River Shannon SAC in the context of proposed borehole locations and grab samples is illustrated in Figure 5-1. Areas of mudflats and sandflats [1140] Annex I habitat are also considered to represent wetland habitat which forms a qualifying interest of the River Shannon and River Fergus Estuaries SPA.

The methodology proposed for borehole drilling will utilise a cable percussive approach through soft overburden and, where required, follow-on rotary coring for recovery of firm granular/till material and bedrock. The legs of the jack-up rig from which the works will take place will cover an area of 1m² each (for a combined total of 4m²), while the boreholes themselves will be drilled within a steel casing 200mm in diameter.

Table 5-1 details the predicted areas within each of the Annex I habitats within the Lower River Shannon SAC, to be affected by the proposed borehole drilling. It is noted that the entire Marine SI area is mapped as being Annex I habitats: estuaries. This mapping overlaps that of the Annex I habitats reefs and mudflats and sandflats and as such boreholes within these habitats have been subtracted from the number within estuaries habitats to avoid double counting of areas.

Table 5-1: Predicted areas of Annex I habitats within Lower River Shannon SAC to be affected by the proposed Marine SI works

Annex Habitat	No. Boreholes Proposed	Total Area of Proposed Boreholes (m ²)	Total Cumulative Area of Jack-Rig Footings (m ²)	Total Area Affected (m ²)	Total area of Annex Habitat SAC (ha)	Percentage of Total Area Affected (%) [Boreholes only]
Estuaries [1130]	7	4.396	28	32.396	32.396	0.000014
Mudflats and Sandflats [1140]	0	0	0	0	0	0
Reefs [1170]	0	0	0	0	0	0

As reflected by the information presented in Table 5-1, the total affected areas will be extremely small and represent an extremely small proportion of the total areas of the relevant Annex I habitats supported within the SAC, in addition to wetland habitats of the River Shannon and River Fergus Estuaries SPA. However it is noted that these total areas are not reflective of permanent losses to relevant Annex I or wetland habitats, indeed no permanent habitat losses are predicted to arise as a result of the proposed project. The vast majority of the affected area will comprise areas to be affected by the placement of the 1m² footings for the jack-up rig with a much smaller proportional area comprising that of the boreholes themselves.

Potential impacts associated with the deployment of the jack-up rig footings will be extremely short-term in nature and will only temporarily disturb the marine bed. These potential impacts are predicted to be similar to the deployment of a boat anchor within the relevant habitats and will not give rise to any alterations to these habitats beyond the minor and short-term. The areas over which these effects would occur are extremely small in the context of the areas of the relevant Annex I habitats supported across the SAC.

On this basis it is considered that the proposed use of a jack-up rig and associated footing on the estuary bed, to undertake marine SI works, will give rise to no significant loss of habitat within the Lower River Shannon SAC or the significant loss of wetland habitats within the River Shannon and River Fergus Estuaries SPA.

The proposed borehole creation, within the relevant areas of Annex I habitats, will involve the direct disturbance of a 200mm wide circle of habitat, per borehole, for estuary and mudflat habitats. Direct disturbance of the habitat associated with borehole creation will be extremely temporary in nature, as it is anticipated that borehole locations will be subject to rapid and natural filling by surrounding sediments following completion of the works, through normal tidal action and other natural processes. These effects will occur within an energetically active marine environment which supports significant quantities of mobile sediment as part of the natural processes of sediment transport which occur throughout the estuary including the areas proposed for SI works. For habitat types affected by the works, the areas over which such effects would occur are extremely small in the context of the areas of the relevant Annex I habitats across the SAC, being a very small fraction (fourteen one millionths) of one percent of the Annex I 'Estuary' habitat within the SAC, as set out at Table 5-1.

As illustrated in Figure 5-1 and Figure 5-2, the proposed investigations are to be placed on Annex I estuary or mudflat and sandflat habitat. Based on the mapping provided by NPWS in its dataset of Annex I habitats¹, there is no site investigation work proposed on Annex I reef habitat. In proposing their locations, the Applicant took into consideration not only the Annex I data available on the NPWS website, but also results of benthic survey undertaken as part of investigations under LIC 230014. Results of benthic survey undertaken by APEM Group in December 2024 are illustrated in Figure 4.1 'Areas of reef and soft sediment identified in Area A at Foynes Island' of an unpublished survey report (Paul *et al.* 2025). That figure is reproduced here as Figure 5-3, and shows that areas of reef were not identified during an up-to-date survey as occurring in the area adjacent to and most proximate to the area proposed for site investigations at Site C.

On the basis of the most recent scientific information available to the applicant, no site investigations are proposed in Annex I reef habitat. There is always a possibility however, of encountering previously unmapped reef habitat, and it is possible that reef may occur in the areas of proposed marine site investigations. LIC 230014 included Condition 28 for the protection of reef habitat, which stated –

No borehole activity shall take place in Reef habitat (EU Annex 1 habitat code 1170). All borehole activity shall be undertaken under the direct supervision of a suitably qualified person or persons with appropriate geophysical and/or benthic ecology experience in identifying Reef habitat, who shall be present on the survey vessel/drill rig during borehole activity and who shall be empowered to halt such borehole activity where necessary to protect Reef habitat.

To prevent unintentional damage to any areas of previously unrecorded reef habitat, the same control measure must be applied to the proposed site investigations in Sites C & D.

As regards the site investigations occurring in the estuary and mudflat & sandflat habitat types, such small-scale temporary effects are not considered representative of an adverse impact upon the integrity of the qualifying features, furthermore it is not predicted that such effects would give rise to any wider

¹ Available at: <https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17/2019/habitats/coastal-habitats>

impacts to the favourable structure and functioning of the wider areas of Annex I or wetland qualifying habitats which they are predicted to affect.

On this basis it is considered that temporary impacts associated with borehole creation within areas of Annex I estuary habitat within the Lower River Shannon SAC and intertidal wetlands of the River Shannon and River Fergus Estuaries SPA would not give rise to significant habitat loss effects upon either of these European sites.

Proposed grab sampling will involve the removal of a maximum of 0.1m² of material at each sample location. The single proposed vibrocore comprises an area of 0.004m². It is considered that such small sample volumes will have no potential to give rise to significant effects upon any Annex I habitat within the SAC through habitat loss.

On the basis of the above it is considered that the proposed marine SI project would not have potential to give rise to any adverse impacts upon the integrity of either the Lower River Shannon SAC or the River Shannon and River Fergus Estuaries SPA through Annex I estuary habitat loss. This conclusion has been made in the absence of the application of mitigation measures.

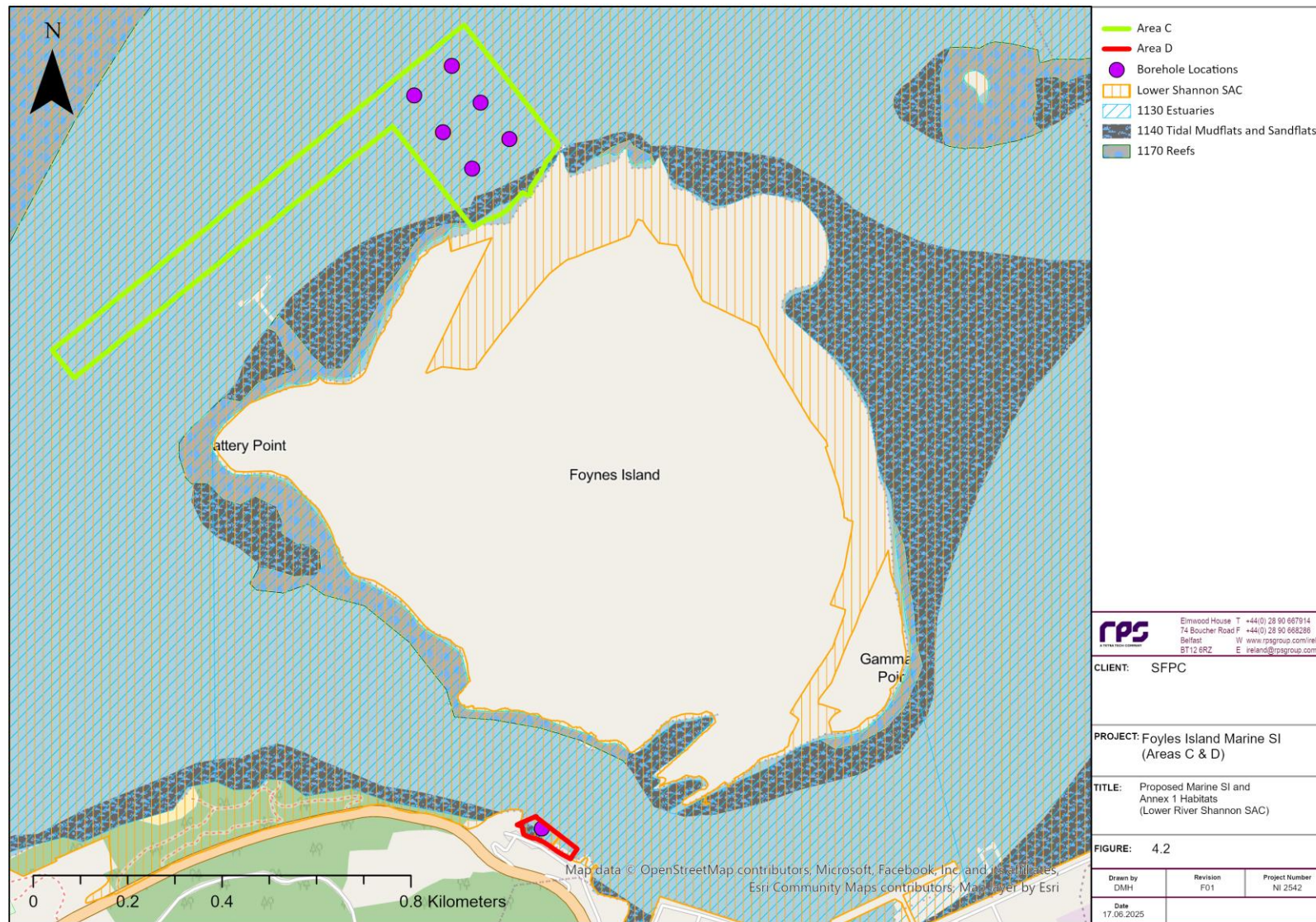


Figure 5-1: Proposed Borehole Locations and Annex I Habitats (Lower River Shannon SAC)

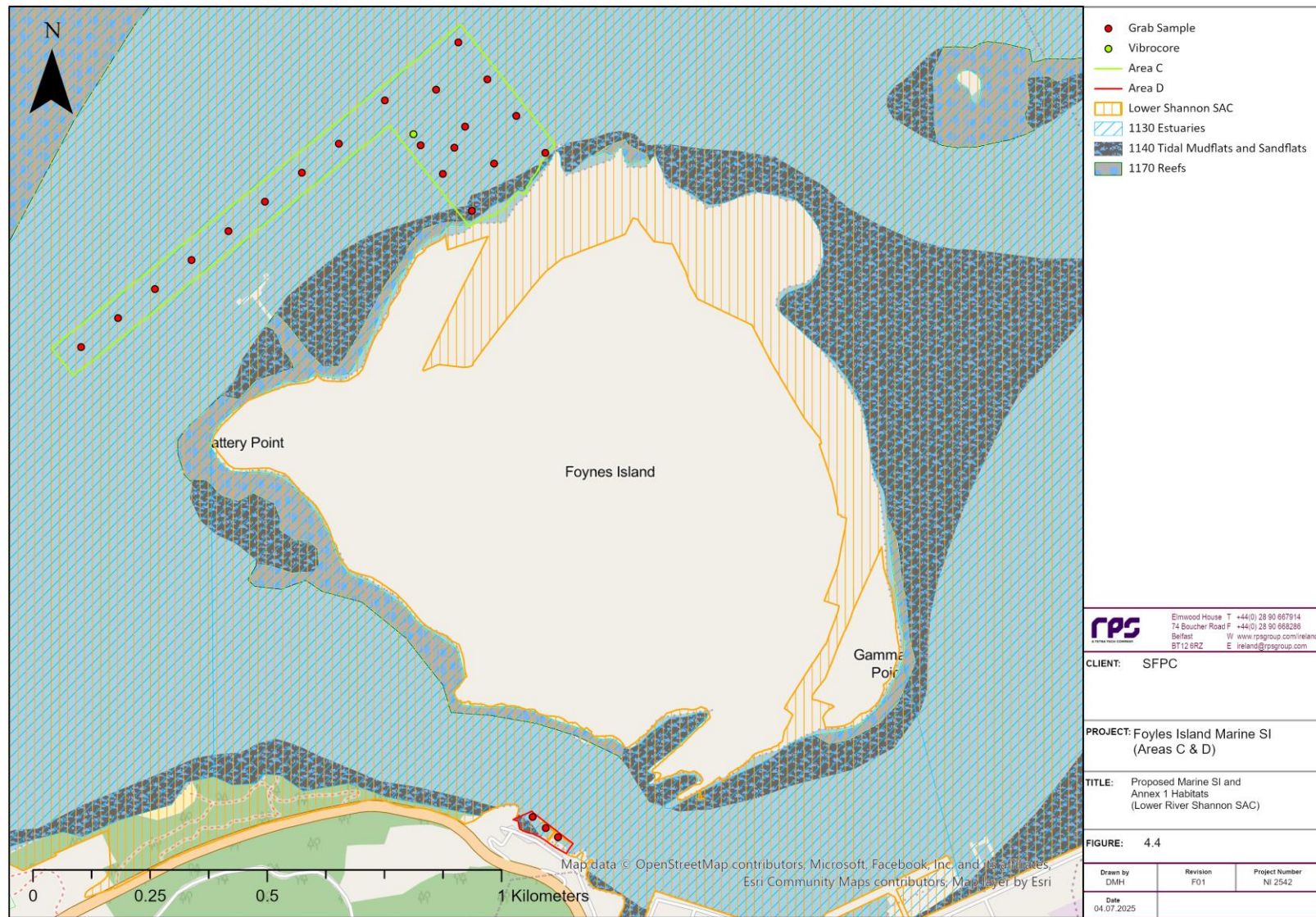


Figure 5-2: Proposed Vibrocore, Benthic Ecology Grab Sample Locations and Annex I Habitats (Lower River Shannon SAC)

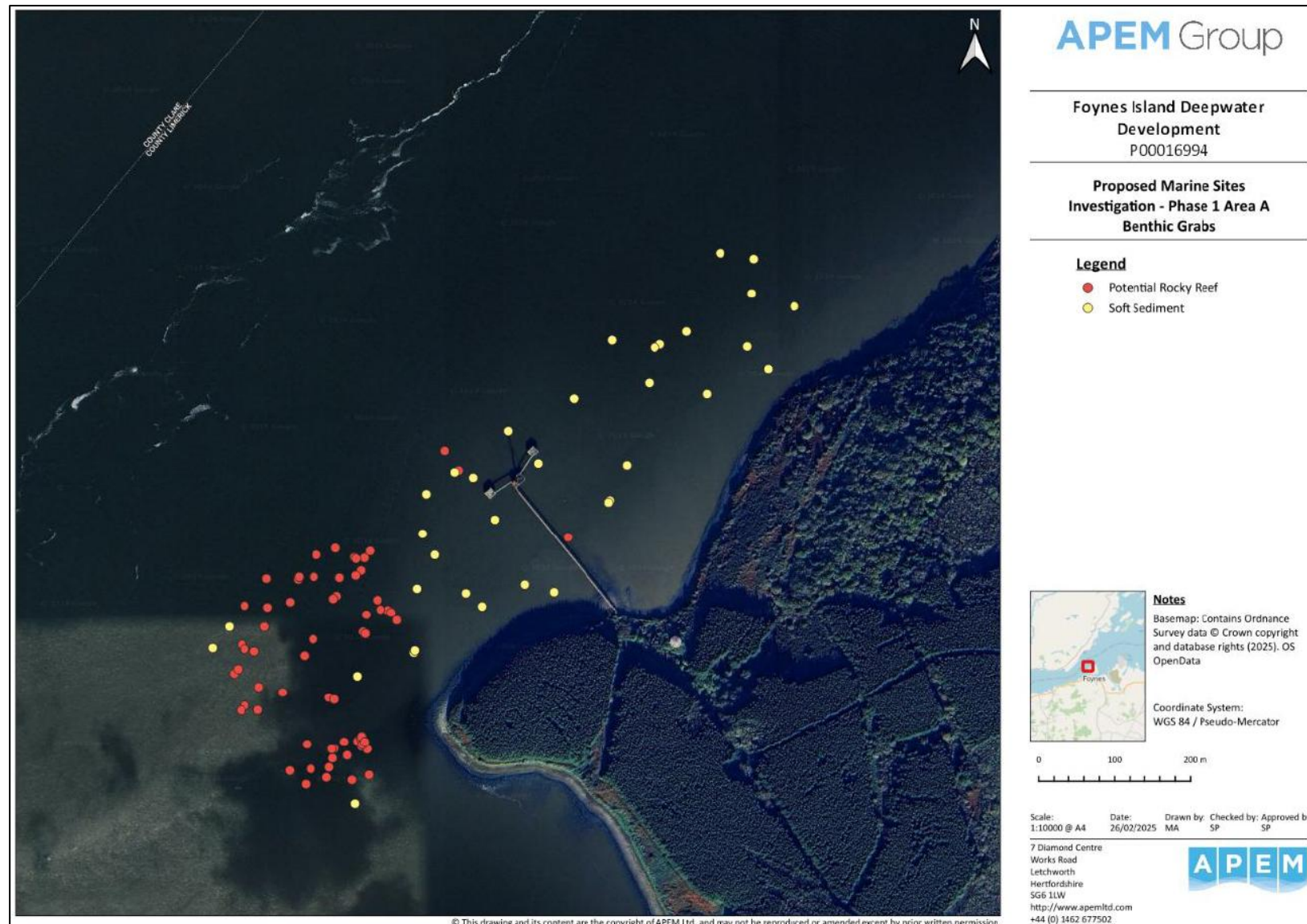


Figure 5-3: Areas of reef and soft sediment identified during Benthic Survey conducted under LIC 230014

5.1.2 Water Quality and Habitat Deterioration

1.1.3.1 Suspended Solids

The Qis/SCIs of the following European sites have been screened in for further assessment in relation to water quality and habitat deterioration linked to suspended solids (Table 5-2).

Table 5-2: LSEs upon sites and features through suspended solids

Site	Feature
Lower River Shannon SAC [002165]	<i>Petromyzon marinus</i> (Sea Lamprey) [1095]
	<i>Lampetra planeri</i> (Brook Lamprey) [1096]
	<i>Lampetra fluviatilis</i> (River Lamprey) [1099]
	<i>Salmo salar</i> (Salmon) [1106]
	<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]*
	<i>Lutra lutra</i> (Otter) [1355]*
River Shannon and River Foynes Estuaries SPA [004077]	Cormorant (<i>Phalacrocorax carbo</i>) [A017] *
	Whooper Swan (<i>Cygnus cygnus</i>) [A038] *
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] *
	Shelduck (<i>Tadorna tadorna</i>) [A048] *
	Wigeon (<i>Anas penelope</i>) [A050] *
	Teal (<i>Anas crecca</i>) [A052]*
	Pintail (<i>Anas acuta</i>) [A054] *
	Shoveler (<i>Anas clypeata</i>) [A056] *
	Scaup (<i>Aythya marila</i>) [A062] *
	Ringed Plover (<i>Charadrius hiaticula</i>) [A137] *
	Golden Plover (<i>Pluvialis apricaria</i>) [A140] *
	Grey Plover (<i>Pluvialis squatarola</i>) [A141] *
	Lapwing (<i>Vanellus vanellus</i>) [A142] *
	Knot (<i>Calidris canutus</i>) [A143] *
	Dunlin (<i>Calidris alpina</i>) [A149] *
	Black-tailed Godwit (<i>Limosa limosa</i>) [A156] *
	Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] *
	Curlew (<i>Numenius arquata</i>) [A160]*
	Redshank (<i>Tringa totanus</i>) [A162]*
	Greenshank (<i>Tringa nebularia</i>) [A164] *
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] *
	Wetland and Waterbirds [A999]*

*Investigation into impact upon species prey

The proposed works will result in disturbance to the estuary bed, both through the placement of jack-up rig footings and through the creation of the borehole itself. The methodology proposed for borehole drilling will involve cable percussive drilling through soft overburden. This methodology, which is less energetic than rotary drilling, will give rise to minimal dispersal of sediments, with the coring taking place within the 200mm steel casing. While rotary drilling will subsequently be utilised to penetrate underlying bedrock, as required, this will occur at depth and as such surrounding overburden is likely to limit the dispersal of sediments. Again, rotary drilling will take place within the 200mm steel casing which will also limit, to a certain extent, arising suspended sediments. The works will not involve the use of additional substances which could enter the water column as suspended solids, with any arising

suspended sediments being limited to natural materials already present within the estuarine environment.

The proposed borehole drilling will take place on the bed of estuarine waters which are subject to significant sediment transport associated with the tidal action on soft overburdens including sand and mud and significant suspended sediments which are washed down into the estuary from the River Shannon and River Fergus catchments, with the Shannon Estuary in total drawing from an inland catchment of approximately 17,963 km².

Habitats within proximity to the proposed SI works are estuarine and intertidal habitats including reefs and mudflats and sandflats. These habitats are not particularly sensitive to adverse effects associated with the movements of small quantities of suspended and subsequently deposited sediments, as such habitats will interact with such sediments continuously as natural sediment transport occurs throughout the estuary system.

Annex II species for which the Lower River Shannon SAC is designated include a range of species which are sensitive to sedimentation including freshwater pearl mussel, sea lamprey, brook lamprey, river lamprey and salmon. The sensitivity of these species to adverse effects associated with sedimentation is largely limited to the headwaters of freshwater watercourses in which the species breed. The proposed works lie downstream of all freshwater habitats within the SAC and as such have no potential to give rise to likely significant effects upon freshwater pearl mussel or breeding habitats of importance for QI fish species. It is considered that the proposed works, given the small quantities of sediment likely to arise, would have no potential to give rise to any likely significant adverse effects upon QI fish species of the Lower River Shannon SAC during the adult portion of their life cycle.

Given that potential sedimentation effects arising as a result of the proposed works will be extremely minimal in nature and will occur over a short period of time, and in the context of information set out above, it is considered that there will be no potential for adverse effects upon non-QI fish species within the area proposed for works. As such it is considered that the proposals would have no potential to give rise to likely significant sedimentation effects upon foraging otter within proximity to the proposed marine SI works.

As discussed above, given the nature of the estuary environment which supports relatively large quantities of suspended sediments and supports significant sediment transport through natural processes, in addition to the lack of predicted impacts upon fish populations generally, it is considered that there is no potential for likely significant sedimentation effects on either the QI species common bottlenose dolphin or upon wintering or breeding SCI bird species associated with the River Shannon and River Fergus Estuaries SPA.

No sedimentation effects to any further, more distantly situated European sites, are predicted to arise as a result of the proposed works.

On the basis of the above information, it is considered that sedimentation effects associated with the proposed SI works would not have the potential to give rise to adverse impacts upon the integrity of any European Site. This conclusion was drawn in the absence of the application of mitigation measures.

1.1.3.2 Pollution Incidents

The QIs/SCIs of the following European sites have been screened in for further assessment in relation to water quality and habitat deterioration linked to pollution incidents (fuels, oils etc.) (Table 5-3).

Table 5-3: LSEs upon sites and features through pollution incidents

Site	Feature
Lower River Shannon SAC [002165]	Estuaries [1130]
	Reefs [1170]
River Shannon and River Foynes Estuaries SPA [004077]	Cormorant (<i>Phalacrocorax carbo</i>) [A017]
	Whooper Swan (<i>Cygnus cygnus</i>) [A038]
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]
	Shelduck (<i>Tadorna tadorna</i>) [A048]
	Wigeon (<i>Anas penelope</i>) [A050]
	Teal (<i>Anas crecca</i>) [A052]
	Pintail (<i>Anas acuta</i>) [A054]
	Shoveler (<i>Anas clypeata</i>) [A056]
	Scaup (<i>Aythya marila</i>) [A062]
	Ringed Plover (<i>Charadrius hiaticula</i>) [A137]
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]
	Grey Plover (<i>Pluvialis squatarola</i>) [A141]
	Lapwing (<i>Vanellus vanellus</i>) [A142]
	Knot (<i>Calidris canutus</i>) [A143]
	Dunlin (<i>Calidris alpina</i>) [A149]
	Black-tailed Godwit (<i>Limosa limosa</i>) [A156]
	Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]
	Curlew (<i>Numenius arquata</i>) [A160]
	Redshank (<i>Tringa totanus</i>) [A162]
	Greenshank (<i>Tringa nebularia</i>) [A164]
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]
	Wetland and Waterbirds [A999]

There is a risk involved with any activity involving the use of machinery within the marine environment that a pollution incident might arise resulting from spills or leaks of polluting substances into the water. There is potential for the works required, inclusive of the movement of a jack-up barge and associated tug and workboat, to give rise to pollution events from discharges of hydrocarbon fuels, oil-based lubricants and other chemicals. It is noted however that risks are extremely minimal, typical of the movement of any motor-operated vessel, as occurs continually within the Shannon Foynes Port environment.

It is considered that given the nature of the proposals, which are small in scale, will not involve the use of large volumes of hydrocarbon fuels or other chemicals, that any potential pollution incidents potentially arising as a result of the proposed development will be very minor.

Significant mixing of seawater occurs within the Shannon Estuary with freshwater flowing in from the surrounding river catchments. The mixing of any polluting materials that escape to the marine environment as a result of the proposed works is further aided by the tidal currents, wind and wave climate which transport and continue to mix the seawater and freshwater (and any polluting substances) both into and out of the Shannon Estuary, and help it disperse widely and dilute to much lower concentrations to the point where it cannot be detected above background levels. On this basis any potential minor inputs arising as a result of the proposed works are highly likely to be undetectable.

beyond the immediate vicinity of the proposed works. It is considered likely therefore that any potential spills will be slowly dispersed into the wider estuary or biodegrade or settle within proximity to the works location.

The site of the proposed SI works will take place within areas which support Annex I habitats within the Lower River Shannon SAC, as detailed above, and intertidal wetlands which are a qualifying feature of the River Shannon and River Fergus Estuaries SPA.

An accidental pollution spill associated with the proposed marine SI works would not likely sufficiently dissipate prior to interacting with Annex I habitats within the Lower River Shannon SAC, namely reefs, mudflats and sandflats and estuaries to be able to exclude likely significant effects without adequate mitigation. Furthermore wetland habitats forming qualifying features of the River Shannon and River Fergus Estuaries SPA may be similarly affected.

Oil spills, including that of crude oil and other hydrocarbons, can give rise to potentially significant effects upon seabird populations. These effects result from impregnation of seabird plumage by hydrocarbon pollutants, floating on the sea surface, which reduces the ability of the feathers to provide waterproofing and insulation. Mortality subsequently occurs most commonly through hypothermia and starvation (Bourne 1968; Jenssen 1994), but can also arise through suffocation, poisoning and dehydration.

These impacts can occur when birds physically come into contact with spilled hydrocarbons which float on the surface of marine waters in a film. In the case of crude oil and diesel spills, these surface films are heavier and less liable to quickly disperse, due to the presence of longer-chain hydrocarbons (Paulauskiene et al., 2014). Other petroleum products produce lighter spills which disperse and break down more quickly. All these hydrocarbons are subject to dispersal and biodegradation within the marine environment and as such the potential oiling effects of such surface films on seabirds reduces with distance from the site of a spill (Al Majed et al., 2012) and reduces with increased wind and wave action which increases the extent of mixing, which accelerates breakdown.

Compared to the potential for spills which could arise from oil product tankers traversing the shipping lanes in proximity to Foynes Island, on the way to and from Shannon Foynes Port, the proposed site survey activities have a very limited potential to give rise to significant spillage of hydrocarbons onto the surface of the marine waters in the licence area. However, there remains a small risk of accidental hydrocarbon spill pollution events from the vessels and associated equipment used for the proposed surveys.

To consider the risk of oiling effects on seabirds representing SCI species of the River Shannon and River Fergus Estuaries SPA, their vulnerability to oiling effects was investigated. Williams et al. (1995) provided an Oiling Vulnerability Index ("OVI"). The OVI score for each species reflects a variety of factors including the species ecology (notably the time spent on the surface of the water and/or the need to dive into marine waters), their reliance on the marine environment, population recovery time and population size. Considering all these aspects, the OVI provides a ranked list of vulnerability (from high to low) for the species considered. Species with lower OVI scores are less vulnerable to the effects of oiling, while species with higher scores are more vulnerable to such effects. The OVI scores provided by Williams *et al.* (1995) are set out in Table 5-4.

The quantitative oil vulnerability index (OVI) developed and presented in Williams *et al.*, (1995) is based on four factors, to assess the vulnerability of seabird species to surface pollution. OVI ratings have been based on the following factors:

- Proportion of each species that was oiled of those found dead (or moribund) on the shoreline and proportion of time spent on the surface of the sea by that species;
- Biogeographical population of the species;
- Potential rate of recovery of the species following a reduction in numbers; and
- Reliance of the species on the marine environment.

Table 5-4: Seabird SCI species of River Shannon and River Fergus Estuaries SPA considered vulnerable to oiling risk as a result of proposed site survey activities.

Species	OVI score
Cormorant <i>Phalacrocorax carbo</i>	20
Scaup <i>Aythya marila</i>	20
Black-headed gull <i>Chroicocephalus ridibundus</i>	11

No further SCI species of the River Shannon and River Fergus Estuaries SPA were included within the Williams et al. (1995) analysis as they are either waterfowl or waders which are not noted to be vulnerable to the effects of surface water oiling.

Taking a precautionary approach to potential oiling risk vulnerability reported by Williams et al. (1995); provides an objective basis to determine whether or not accidental spillages of hydrocarbon fuels and oil products as a result of the proposed site survey activities could potentially result in mortality of individuals of certain SCI populations of the River Shannon and River Fergus Estuaries SPA.

No LSEs to any further European sites considered within this assessment through impacts arising through pollution incidents will occur.

It is considered therefore that identified likely significant pollution effects upon the Lower River Shannon SAC and the River Shannon and River Fergus SPA not excluded at the screening stage would, in the absence of mitigation measures give rise to adverse impacts upon the integrity of intertidal and estuarine habitats of the Lower River Shannon SAC and intertidal wetlands of the River Shannon and River Fergus Estuaries SPA, in addition to SCI bird species themselves through limited environmental toxicity and surface water oiling.

Mitigations measures are therefore required and set out below at Section 5.3, below.

5.1.3 Underwater Noise and Disturbance

As described in Section 3, some aspects of the proposed SI works will require activities in the marine environment including activities producing underwater noise, including:

- Movement of a single work boat, tug and jack-up barge within the estuary to facilitate proposed works.
- Undertaking of 7 no. boreholes incorporating a cable percussive drilling method through soft overburden and a rotary drilling method through underlying bedrock where required.
- A geophysical survey to map the seabed and underlying layers, using a sub-bottom profiler, a side scan sonar and a multibeam echosounder system.

These activities carry a risk of noise induced effects upon some marine species as a result of underwater acoustic energy being released into the marine environment. LSEs through underwater noise upon QI species of the following European sites, designated on account of fish species, birds, otter, bottlenose dolphin, harbour porpoise or grey seal, were not excluded at the screening stage (Table 5-5).

Table 5-5: LSEs upon sites and features through underwater noise

Site	Feature
Lower River Shannon SAC [002165]	<i>Petromyzon marinus</i> (Sea Lamprey) [1095]
	<i>Lampetra planeri</i> (Brook Lamprey) [1096]
	<i>Lampetra fluviatilis</i> (River Lamprey) [1099]
	<i>Salmo salar</i> (Salmon) [1106]
	<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]
	<i>Lutra lutra</i> (Otter) [1355]
Blasket Islands SAC [002172]	<i>Phocoena phocoena</i> (Harbour Porpoise) [1351]
	<i>Halichoerus grypus</i> (Grey Seal) [1364]
Slyne Head Islands SAC [000328]	<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]
	<i>Halichoerus grypus</i> (Grey Seal) [1364]
Slyne Head Peninsula SAC [002074]	<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]
West Connacht Coast SAC [002998]	<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]
	<i>Phocoena phocoena</i> (Harbour Porpoise) [1351]
Duvillaun Islands SAC [000495]	<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]
Kenmare River SAC [002158]	<i>Phocoena phocoena</i> (Harbour Porpoise) [1351]
Roaringwater Bay and Islands SAC [000101] River Shannon and River Foynes Estuaries SPA [004077]	<i>Phocoena phocoena</i> (Harbour Porpoise) [1351]
	Cormorant (<i>Phalacrocorax carbo</i>) [A017]
	Whooper Swan (<i>Cygnus cygnus</i>) [A038]
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]
	Shelduck (<i>Tadorna tadorna</i>) [A048]
	Wigeon (<i>Anas penelope</i>) [A050]
	Teal (<i>Anas crecca</i>) [A052]
	Pintail (<i>Anas acuta</i>) [A054]
	Shoveler (<i>Anas clypeata</i>) [A056]
	Scaup (<i>Aythya marila</i>) [A062]
	Ringed Plover (<i>Charadrius hiaticula</i>) [A137]
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]
	Grey Plover (<i>Pluvialis squatarola</i>) [A141]
	Lapwing (<i>Vanellus vanellus</i>) [A142]
	Knot (<i>Calidris canutus</i>) [A143]
	Dunlin (<i>Calidris alpina</i>) [A149]
	Black-tailed Godwit (<i>Limosa limosa</i>) [A156]
	Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]
	Curlew (<i>Numenius arquata</i>) [A160]
	Redshank (<i>Tringa totanus</i>) [A162]
	Greenshank (<i>Tringa nebularia</i>) [A164]
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]
	Wetland and Waterbirds [A999]

Underwater noise is not a persistent effect, and once the noise source ceases to operate noise levels drop near-instantly to pre-existing levels. The natural underwater soundscape of the Shannon Estuary is noisy - biological sounds from fish and marine mammals are mixed with sounds from waves and surface noise; current flow and turbulence; rain and wind/storm noise; and noise from shipping and leisure craft activities dominates busy areas such as ports. The ambient noise levels in coastal and inshore water, bays and harbours are subject to huge variation.

Lower River Shannon SAC is designated for the supported population of common bottlenose dolphin. No other European site within 20km of Foynes Island or its surrounds is designated for a species of marine mammal.

Proposed marine SI works will take place in close proximity to the Shannon Foynes Port, which supports regular marine traffic generating significant underwater noise.

In order to characterise the potential effects of construction noise, the magnitude of the effect and the sensitivity of the receptors determines the overall impact. Table 5-6 summarises the sensitivities of marine mammal species with regard to noise thresholds. A permanent threshold shift (PTS) occurs when a permanent auditory injury results in loss of hearing. PTS can result in very significant to profound negative impacts on marine species. A temporary threshold shift (TTS) describes a temporary but recoverable loss of hearing due to exposure to high energy sounds for a short duration or lower energy sounds for a longer duration. The impact of TTS is significant but recoverable. Determining the likelihood of noise sensitive species being exposed to such noise levels will help to categorise the significance of effects on each species. The international guidance on underwater noise threshold levels for marine mammals is published in Southall *et al* (2019) and provides (inter alia) the following thresholds (Table 5-6).

Table 5-6: TTS- and PTS-onset thresholds for marine mammals exposed to non-impulsive noise

Marine mammal hearing group	TTS onset: SEL (weighted) dB re 1 μ Pa _{2s}	PTS onset: SEL (weighted) dB re 1 μ Pa _{2s}
Low Frequency Cetaceans (baleen whales)	179	199
High Frequency Cetaceans (most dolphin species)	178	198
Very High Frequency Cetaceans (Harbour Porpoise)	153	173
Phocid Carnivores (seal species)	181	201
Other Carnivores (otters)	199	219

Grey seals have been recorded as largely tolerant to underwater noise (J. Parsons in G.D. Green *et al.* 1985) with pinnipeds generally being resilient to the effects of regular high intensity underwater noise with localised avoidance recorded in association with underwater noise of up to and greater than 190dB (Harris *et al.* 2001). Both grey and harbour seals are known to frequent areas which are subject to relatively high levels of anthropogenic disturbance including busy ports (Brooks *et al.* 2016), marinas (Bankhead *et al.* 2023) and offshore wind farms (Russell *et al.* 2016).

The type of coring and or drilling proposed as well as the size of the boreholes mean that sound levels from the activity is unlikely to exceed previously recorded level of similar setups with source levels of 130-147dB SPL₂ (re 1 μ Pa) (Erbe & McPherson, 2017; MR, M, M, & I, 2010). Recent measurements of

² As per ISO 18405:2017, section 3.2.1.1

geotechnical drilling in shallow waters (Huang Long-Fei et al. 2023) recorded an SPL of 155.9 dB re 1µPa rms @ 1 m at a peak frequency of 45 Hz.

These levels are below the source levels of even quiet vessels and at modest ranges of c. 100 m, below the commonly used 160dB SPL³ limit for behavioural effect for marine mammals.

It is considered that the proposed borehole drilling works will have limited potential to give rise to underwater noise effects in addition to background noise levels and those associated with the operation of Shannon Foynes Port. The area around Foynes Island is not identified in Map 16 of the Lower River Shannon SAC Conservation Objectives document as a 'critical area' for common bottlenose dolphin, but nonetheless, elevated levels of man-made noise will occur throughout the works.

Comparing the weighted source level of the drilling/boring, 147dB SPL, with the limit for hearing impact (178dB SEL⁴, TTS limit; 153dB SEL, TTS limit, 181dB SEL, TTS limit) for the common bottlenose dolphin, harbour porpoise and grey seal respectively, shows that any hearing impact from the activity is extremely unlikely.

The geophysical survey (sub-bottom profiling, multibeam echosounder survey and side scan sonar survey) will utilise acoustic signals to ensonify the seabed and the underlying layers.

MacGillivray et al. (2014) showed that low-frequency sources such as sub-bottom profilers were the most audible sources to large baleen whales. Mid-frequency sources (fisheries, communication, and hydrographic systems) were the most audible sources to odontocetes at ranges below 3km, but low-frequency sources began to dominate between 3 and 10 km. Low and mid-frequency systems have similar estimated audibility for seals due to their broad hearing range. MacGillivray et al. (2014) used modelling to explore the acoustic effects of marine survey sound sources on marine mammals. They reviewed the acoustic signatures of widely used equipment. Sub-bottom profilers produced frequencies of 1-6 kHz at a source level of 200 dB re 1µPa @1m, while multibeam and side-scan sonar produced much higher frequencies of 200-230kHz at 218-229 dB re 1µPa @1m.

For all species, modelled sensation levels are lowest for the high-frequency sources (side-scan and multibeam), which operate at the upper limits of the audible spectrum. The estimated zone of audibility for all species is largest for the low-frequency sources (sub-bottom profiler), which propagate over longer distances relative to the rapidly attenuating high frequencies. Thus bottlenose dolphins, harbour porpoise or grey seal if very close to the vessel during site investigations may lead to disturbance and at worse auditory injury through temporary threshold shift (TTS).

Equipment used during a geophysical survey can potentially cause hearing impact (exceed the TTS limit) to a significant distance. Given that the specific type of equipment used is unknown, impacts from this source are considered to have potential to give rise to auditory injury to common bottlenose dolphin.

It is understood that QI fish species of the Lower River Shannon SAC, including sea lamprey, brook lamprey and river lamprey are, at several stages in their life cycle, vulnerable to the effects of high levels of underwater noise and vibration. While adult salmon are not particularly sensitive to relatively low intensity underwater noise (Harding et al. 2016) their larval stages are more vulnerable and particularly sensitive to underwater vibration. Given that QI fish species in general lack the ability to detect high frequency sounds (lack of swim bladder or connection from swim bladder to inner ear) they are at little to no risk from the geophysical survey that primarily uses higher frequencies (> 10 kHz).

The low source levels from the geotechnical works (boring/drilling) means that, even at close ranges, there is little to no auditory risk to fish or their larvae from this activity.

Additionally, the proposed works will take place at a significant distance downstream of any spawning habitat for QI fish species within the SAC and any potential underwater noise or vibrational effects

³ NOAA Type B harassment for non-impulsive noise

⁴ As per ISO 18405:2017, section 3.2.1.5

predicted will only have potential to interact with juvenile or adult fish which are not recorded to be particularly sensitive to such effects. It is considered therefore that underwater noise and vibration would not have potential to give rise to likely significant adverse effects upon QI fish species of the Lower River Shannon SAC.

Given the nature of the works, which will take place during daylight hours and within the marine environment, it is not considered that there would be any potential for likely significant adverse effects to otter populations within the SAC given their largely nocturnal habit and in the context of existing levels of disturbance at Shannon Foynes Port, along with their relatively poor hearing sensitivity at higher frequencies under water.

Bird populations within the River Shannon and River Fergus Estuaries SPA are considered to be sensitive to underwater noise and vibrational disturbance effects arising as a result of the proposed SI works. There is an absence of scientific understanding of the use of underwater sound by diving birds and the extreme lack of scientific data on the underwater hearing capabilities of such birds, with evidence of underwater hearing in birds being only recently discovered (Hansen et. al 2017). While diving marine bird species have been shown to react to underwater noise (Anderson Hansen et al. 2020) there is no evidence that such reactions would give rise to any adverse effects upon the population where such effects occur over the short term. As is well known, and unlike in mammals, birds regenerate their auditory hair cells after all forms of auditory injury (Stone and Cotanche 2007). As such, unlike marine mammals where there is potential for long-term effects associated with auditory injury, whether temporary or permanent threshold shift, such effects cannot arise in respect of birds.

On this basis adverse effects upon the integrity of the River Shannon and River Fergus Estuaries SPA will not arise as a result of underwater noise effects upon SCI bird populations, likewise for otters within the Lower River Shannon SAC.

Adverse effects upon QI common bottlenose dolphin, harbour porpoise or grey seal populations associated with the above listed SACs as a result of underwater noise and vibrational effects cannot be excluded in the absence of mitigation measures in respect of the proposed geophysical surveys only.

5.1.4 Aerial Noise and Visual Disturbance

The QI/SCI species of the following European sites have been screened in for further assessment in relation to aerial noise and visual disturbance (Table 5-7).

Table 5-7: LSEs upon sites and features through pollution incidents

Site	Feature
Lower River Shannon SAC [002165]	<i>Lutra lutra</i> (Otter) [1355]
River Shannon and River Foynes Estuaries SPA [004077]	Cormorant (<i>Phalacrocorax carbo</i>) [A017]
	Whooper Swan (<i>Cygnus cygnus</i>) [A038]
	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]
	Shelduck (<i>Tadorna tadorna</i>) [A048]
	Wigeon (<i>Anas penelope</i>) [A050]
	Teal (<i>Anas crecca</i>) [A052]
	Pintail (<i>Anas acuta</i>) [A054]
	Shoveler (<i>Anas clypeata</i>) [A056]
	Scaup (<i>Aythya marila</i>) [A062]
	Ringed Plover (<i>Charadrius hiaticula</i>) [A137]
	Golden Plover (<i>Pluvialis apricaria</i>) [A140]
	Grey Plover (<i>Pluvialis squatarola</i>) [A141]
	Lapwing (<i>Vanellus vanellus</i>) [A142]
	Knot (<i>Calidris canutus</i>) [A143]
	Dunlin (<i>Calidris alpina</i>) [A149]
	Black-tailed Godwit (<i>Limosa limosa</i>) [A156]
	Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]
	Curlew (<i>Numenius arquata</i>) [A160]
	Redshank (<i>Tringa totanus</i>) [A162]
	Greenshank (<i>Tringa nebularia</i>) [A164]
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]
	Wetland and Waterbirds [A999]

1.1.3.3 Annex II Species

Mobile species that live above the water line can also be vulnerable to aerial noise and visual triggers of disturbance. Given the aquatic nature of the vast majority of Annex II QI species for which the Lower River Shannon SAC is designated, it is considered that only otter is vulnerable to the effects of aerial noise and visual disturbance.

It is noted that temporary disturbance to foraging adult otters would be unlikely to give rise to a significant adverse effect as individuals are likely to simply move on to adjacent undisturbed foraging habitat if they were present when a noise producing activity commenced. As the species is largely nocturnal, daytime disturbance to foraging otter is unlikely to occur as a result of the proposed works. Disturbance to this species is more critical where it arises in close proximity to otters with young, particularly disturbance to natal holts or dens, where young are being raised. While resting places utilised by adult otters may be within areas requiring tolerance to disturbance, a key factor in the location of otter breeding sites and natal holts or dens is a lack of regular human disturbance (Liles 2003).

Surveys for otter were undertaken of Foynes Island by RPS in 2023. These surveys included the vast majority of the coastline of the island, which was surveyed for evidence indicating the presence of otter in addition to any sources of fresh surface water, principally watercourses which give an indication of the suitability of areas of the island for breeding otter.

An extremely important factor which influences the location of holts is a nearby constant source of freshwater. Otters that hunt in the sea need to be able to wash the salt of their fur before they can return to their dens/holts, otherwise the fur's water proofing properties are seriously impaired (Chanin P, 2013). This was observed in vitro, after otters were soaked in seawater and dried, their fur insulation ability decreased (Kruuk and Balharry, 1990). If no freshwater was present nearby the seawater, the otters were reluctant to feed in the seawater and if not able to groom in freshwater after seawater exposure the otters' showed signs of hypothermia. It was found that Eurasian otters spent more time grooming using freshwater after being in seawater compared to sea otters (Nolet and Kruuk, 1989). It is thought that the purpose of grooming after saltwater exposure is to re-establish air in their fur and to avoid encrustation of salt on their fur.

Surveys of the island recorded no surface watercourses which are likely to support continuous freshwater flow. Much of the island appears to drain to the estuary via a small number of minor drainage channels which were recorded, across the surveys, to support ephemeral flows. Much of the island's drainage appears to occur through groundwater flows which seep out of the shore rock and are likely to be inundated or have limited accessibility for otter at high tide.

The survey recorded fairly limited signs indicative of the presence of otter including a number of spraint locations along the northern and western shore of the island. Furthermore extensive bird surveys undertaken of the island's coastline in 2022 and 2023 have not recorded any casual sightings of otter.

It is therefore considered relatively unlikely that the island supports a natal holt or den and it is instead hypothesised that the island's shore serves as a part of a wider coastal territory for a single or small number of otter(s).

It is noted that the proposed borehole locations are universally situated in marine habitat in proximity to areas which are subject to relatively high levels of human disturbance associated with the ongoing operation of Shannon Foynes Port or recreational boating. These areas are therefore well away from any potential otter natal holts or dens, which are typically situated within terrestrial habitats well inland of the shore. As such it is considered highly unlikely that natal holts or dens would be present within proximity to proposed GI works locations.

No further SACs within the project's zone of influence would be potentially affected by aerial noise or visual disturbance arising as a result of the proposed works.

On the basis of the above it is considered that the proposed marine SI works would not have potential to give rise to any adverse impacts upon the integrity of any SACs, including Annex II qualifying species populations, through aerial noise or visual disturbance.

1.1.3.4 Special Conservation Interest Bird Species

Likely significant effects as a result of aerial noise and visual disturbance associated with the proposed marine SI works, upon qualifying features of the River Shannon and River Fergus Estuaries SPA, were not excluded at the screening stage.

The River Shannon and River Fergus Estuaries SPA is designated for the supported populations of waders or waterbirds. These species are known to be susceptible to aerial noise or visual disturbance impacts including through abandonment of foraging habitats which, if disturbance is regular or prolonged, can give rise to a functional loss of habitat in the context of the SPA.

A suite of bird surveys of a large proportion of the island's coastline are currently underway incorporating a wetland bird survey methodology in addition to vantage point surveys of areas of the Shannon Estuary between the Island and Shannon Foynes Port. These surveys have been ongoing from October 2022 to present.

The methodology employed was based on the BTO's wetland bird survey (WeBS) Core Counts which use the so-called 'look-see' method (Bibby *et al.*, 2000), whereby the observer, familiar with the species involved, surveys the whole of a predefined area.

Counts were made across all wetland habitats within the surveys area including intertidal habitats and coastal habitat. Numbers of all waterbird species, as defined by Wetlands International (Rose and Scott, 1997), in addition to any other bird species as relevant, were recorded. Target species for the purposes of this survey include the SCI species associated with the River Shannon and River Fergus Estuaries SPA including geese, ducks, waders and waterbirds.

All species encountered during the surveys were mapped and coded using standard BTO species codes.

Bird surveys undertaken of the islands coastline to date have recorded use by fairly low numbers of waders and waterfowl at both high and low tide. This is inclusive of a range of species which are SCI species of the River Shannon and River Fergus Estuaries SPA in low numbers.

The proposed works will involve activities emitting aerial noise and associated with the movement of a single work boat, tug and jack-up rig, in proximity to Foynes Island and the Shannon Foynes Port. As set out above, areas of intertidal mud in proximity to the proposed works are known to support occasional low numbers of SCI species and function as foraging habitat for these species.

Given the findings of bird surveys undertaken of the island's coastline and adjacent areas of intertidal and marine habitat, with a particular focus on areas within the footprint of proposed marine SI works, it is considered that the proposed marine SI works would have potential to give rise to aerial disturbance and displacement of only small numbers of SCI birds, should works take place within the winter period.

Given the relative availability of similar intertidal habitat around the island's shore and the wider estuary it is considered that any such disturbance and associated temporary displacement of such small numbers of SCI birds would have only minor adverse effects which would not constitute an adverse effect upon the integrity of the site.

Furthermore it is considered that the areas in proximity to proposed marine SI works area are already subject to significant aerial noise and visual disturbance associated with shipping and other vessel movements.

No further SPAs, which are all significantly separated from the proposed works, would be potentially affected by aerial noise or visual disturbance arising as a result of the proposed project.

On the basis of the above it is considered that the proposed marine SI works would not have potential to give rise to any adverse impacts upon the integrity of any SPAs, including SCI bird populations, through aerial noise or visual disturbance arising as a result of the marine SI works.

5.2 In-Combination Effects

Article 6(3) of the Habitats Directive and Irish national law requires that in-combination effects with other plans or projects are considered. The significance of any identified combined effects of the proposed development and other past, present or reasonably foreseeable future plans or projects must also be evaluated. On this basis, a range of other port projects were considered in terms of their potential to have in-combination effects with the proposed works.

5.2.1 Foynes Island Terrestrial SI

In addition to the proposed marine SI, terrestrial SI works in association with the same project design are proposed on Foynes Island and within Shannon Foynes Port, Foynes, Co. Limerick and have been subject to a separate planning and felling license applications.

The scale of the SI works is commensurate with the level of detail required to facilitate the preliminary and detailed design and environmental assessment of the development for the planning application of the wider proposed project which comprises the development of a new deepwater port at Foynes Island.

All aspects of the terrestrial SI work to be undertaken as part of this project will take place within the terrestrial environment with some marine operations required to facilitate access to the island by the relevant plant. These works, have potential to give rise to likely significant effects upon the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA through effects associated with habitat loss and water quality and habitat deterioration.

It is anticipated that these terrestrial SI works will incorporate a range of mitigation measures, to be agreed with Limerick City and County Council and the DHLGH.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

On this basis it is considered that the proposed Foynes Island marine SI works would have no potential to act in-combination with this project.

5.2.2 Capacity Extension at Foynes Port

A project for capacity extension at Foynes Port (file number: 18301561) to facilitate capacity extension at Shannon Foynes Port. This capacity extension has been granted permission and is under construction. Capacity is to be provided in two interrelated ways – increased capacity of the quay wall, and, increased capacity of supporting landside storage facilities and logistics. The project includes two specific elements of development and operational activities as follows:

- Jetty Extension (the joining of the existing 'West Quay' and the 'East Jetty'), and;
- Durnish land development (to provide for increased port related storage and port-centric logistics)

The proposed development seeks to provide for Port Capacity Extension that will consist of the following:

1. **Modifications to the existing jetties and quays to include:** connection of the existing West Quay to the existing East Jetty for the purpose of extending the length of the existing quay to facilitate the mooring of vessels and Port related operations. Development works consist of; (i) Construction of an open piled jetty structure with suspended 116.5 metre concrete deck connecting the West Quay to the East Jetty; (ii) quayside furniture including quay fenders, mooring bollards, safety ladders, toe rail, and lighting columns, (iii) construction and remedial works to the both existing West Quay and East Jetty ends to facilitate structural 'tie-in' of the proposed new jetty structure, (iv) removal of the existing small craft landing pontoon and walkway from its current position affixed to the shore between the West Quay and the East Jetty, and provision of a new small craft landing pontoon and

walkway affixed to the western side of the West Quay wall, and, (v) all associated site development works; and

2. **Phased Expansion of the Port Estate** on 33.95 hectares of land immediately adjacent to the east of the existing port estate to provide serviced industrial land, and, to accommodate marine related industry, port centric logistics and associated infrastructure that will be provided in accordance with a development framework programme prepared for the overall 'expansion' area and which is lodged with the planning application. The development includes:
 - i. site development and infrastructure works to the entire expansion lands on a phased basis including (a) raising of ground levels with fill material to a typical height of +4.34m OD Malin; (b) provision of all associated services including storm water infrastructure and modification to the existing OPW drainage attenuation system; (c) provision of 2.4m high perimeter fencing, (d) landscaping berms and treatments, and (e) all associated site development works; all to be delivered on a phased basis; and
 - ii. Implementation and use of 'Phase 1' of port expansion works including: (a) modification and realignment to part of the existing port estate access road including provision of new roundabout and junction arrangements on that road, and associated lighting, and storm water drainage; (b) provision of new internal Port access road (with associated footpath and combined cycle path) including the provision of bridge structures to facilitate access across existing drainage channels; (c) construction of three covered industrial type warehouse units (with typical maximum ridge height of 15.1m above raised ground level) with associated external storage, parking and circulation areas; (d) the provision of separate dedicated uncovered 'open' storage area/ container storage area and associated circulation and service area (with maximum container stacking height of 8m if/when container storage required); (e) provision of Klargest BE model (or similar) package foul water treatment system with polishing filter and discharge to ground to serve the Phase 1a expansion area; (f) modifications to existing 'Foynes Engineering' industrial building which involves the removal of the 'lean-to' structure affixed to the main building and remedial building and site development works; (g) provision of an ESB electrical substation; (h) provision of lighting columns within the 'Phase 1' expansion area; (i) provision of a new security kiosk and access control barrier on the existing Port access road; (j) provision of noise attenuation measures along parts of the southern and western boundary of 'Phase 1' expansion area; (k) provision of a 'bus-stop' on the existing Port access road; (l) landscaping; and (m) all associated site development works.

This project was subject to Appropriate Assessment as part of the consenting process in 2018. This assessment recommended the implementation of a range of mitigation measures, including those intended to reduce the risk of pollution incidents both at construction and operational stages and underwater noise and vibration effects at construction phase.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

This project is currently under construction and the jetty extension aspects have already been completed and as such would have no potential to act in-combination with the proposed marine SI works. Furthermore, a proportion of the phased port expansion has also been completed further limiting the potential for in-combination effects.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

On this basis it is considered that the proposed Foynes Island marine SI works would have no potential to act in-combination with this project.

5.2.3 Shannon Foynes Port Developments

An application (File number: 2360011) was submitted in January 2023 and has yet to be determined. Proposals include the construction of three covered industrial type warehouse units with associated external storage, parking and circulation areas, upgrade of existing site services and all ancillary works associated with the site development.

This application was subject to appropriate assessment as part of the submissions. This assessment concluded that subject to the implementation of mitigation measures at construction stage, principally to avoid the potential for pollution and associated water quality and habitat deterioration effects, there would be no adverse impacts upon any European sites because of the development. On this basis it is considered that the proposed development would not have potential to act in-combination with the proposed development.

An application (File number: 22742) was submitted in July 2022 for construction of seven covered industrial type warehouse units (with typical maximum ridge height of 14m above raised ground level) with associated external storage, parking and circulation areas; upgrade of existing site services and all ancillary works associated with the site development. This application is for a 10-year permission. The application has yet to be determined.

The application has been supported by a Screening for Appropriate Assessment document and Natura Impact Statement, with any pathways for impacts on any European site mitigated for and screened out, it is noted that the proposed development lies well away from the Shannon Estuary and the associated designated sites and is separated from them by existing port development. As such it is considered unlikely that this proposed development would have potential to act in-combination with the proposed SI works.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

On this basis it is considered that the proposed Foynes Island marine SI works would have no potential to act in-combination with this project.

5.2.4 Mainstream Renewable Power Ltd.

Mainstream has identified potential search or investigation areas which are based on available data and minimise potential impacts to a number of key stakeholders.

The cable corridor and the array investigation areas are search areas in which surveys will be carried out to determine where infrastructure could be located. The Foreshore Licence Application Area is located off the west coast of County Kerry and County Clare approximately 17km at its closest point from the proposed Foynes SI area.

As per the Illen Offshore Array, no supporting information in relation to appropriate assessment has been submitted in support of the foreshore licence for the proposed site investigation works connected with this project.

A natura impact statement has been submitted to support this application outlining mitigation measures required to prevent adverse likely significant effects on any nearby European sites.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

On this basis it is considered that the proposed Foynes Island marine SI works would have no potential to act in-combination with this project.

5.2.5 Moneypoint Offshore Wind

Plans to develop offshore wind farms around the coast of Ireland in support of national and European targets for renewable electricity generation and de-carbonisation of our society.

Comprised of two projects, namely Moneypoint Offshore One Wind and Moneypoint Offshore Two which are both proposed as floating offshore wind projects. Moneypoint Offshore One is located to the west of County Clare and County Kerry and at least 22km from the proposed Foynes Island SI works. This Foreshore licence application relates to proposed Site Investigation (SI) works only.

A natura impact statement has been submitted to support this application outlining mitigation measures required to prevent adverse likely significant effects on any nearby European sites.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

On this basis it is considered that the proposed Foynes Island marine SI works would have no potential to act in-combination with the Moneypoint Offshore Wind project.

5.2.6 Moneypoint Hub Project

Marine SI is proposed as part of the overall Site Investigations in both the terrestrial and marine environment at the ESB facility at Moneypoint in order to inform the future development of the site as an offshore floating wind construction and deployment facility.

This proposal has been supported by documents relevant to appropriate assessment which identified that the proposed SI works would not have potential to give rise to likely significant effects upon the Lower River Shannon SAC, or any other relevant European sites.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

On this basis it is considered that the proposed Foynes Island marine SI works would have no potential to act in-combination with this project.

5.2.7 Shannon Technology and Energy Park

This development is for a site investigations associated with a proposed power plant and LNG terminal located at least 22km from the proposed Foynes Island SI works area.

This proposal has been accompanied by a Natura Impact Statement which identified the potential for likely significant effects upon the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA.

Subject to the implementation of a range of mitigation measures it is concluded that this proposal will not give rise to any adverse effects upon the integrity of any European sites and as such will not have potential to give rise to any in-combination effects alongside the proposed Foynes Island marine SI works.

Furthermore at the current time this project has been refused by An Bord Pleanála.

5.2.8 Eirgrid Cross Shannon 400kV Electricity Cable

This development involves the laying of 400 kV submarine cables across the Lower Shannon Estuary between the Moneypoint 400 kV Electricity Substation in the townland of Carrowdolia South County Clare and Kilpaddoge 220/110 kV Electricity Substation in the townland of Kilpaddoge County Kerry. The proposal is located 19km from the closest aspect of the proposed Foynes Island marine SI works area.

This project was subject to appropriate assessment which identified the potential for likely significant effects upon the qualifying features of the Lower River Shannon SAC through pollution and underwater noise disturbance. Subject to the implementation of mitigation measures in respect of this project in relation to these potential effects, including the use of MMOs, the appropriate assessment concluded no adverse effects on the integrity of this or any other European sites.

This project has now been installed, and no operational phase in combination effects have been identified. On this basis it is considered that this project will have no potential to act in combination with the proposed Foynes marine SI works.

5.2.9 Forestry Licences

Private and Coillte thinning and felling licence applications for lands bordering the Shannon Estuary, located within approximately 2km to the proposed land SI works:

- Approved Coillte thinning for 0.93ha of land at Ballynacragga North (LK01-FL0170).
- Approved private clearfell and thinning for 22.26ha of land at Ballynash (bishop), Glenagragara, Limerick. 6.55h land parcel in proximity to the proposed SI works (TFL00630121).
- Pending Coillte thinning application for 1.75ha of land at Cahiracon (CE07-FL0150).
- Approved private clearfell and thinning for 6.2ha of land at Shannakea more (TFL00306119)

Project TFL00630121 has been subject to appropriate assessment which concluded that, with the implementation of mitigation measures in respect of this project, there would be no adverse impacts to the integrity of any European sites.

- No information is currently available on the incorporation of mitigation measures in respect of the other proposed and accepted thinning and felling projects, it is assumed that these works will have potential to give rise to likely significant effects upon the nearby European sites and as such in the absence of mitigation measures would have potential to act in-combination with the proposed Foynes Island marine SI works, namely those associated with water quality.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

5.2.10 Shannon Foynes Port Company Land Reclamation

The development involves land reclamation works and associated surfacing, services and drainage at the East jetty at Foynes harbour, to take place approximately 0.65km from the proposed Foynes land SI works. The proposal has been supported by a Natura Impact Statement accompanied by an application for a Dump at Sea Permit which covers capital dredging operations where the dredged spoil is to be dumped on an approved site in the Shannon Estuary.

The Natura Impact Statement identified the potential for significant negative effects on the integrity of the Lower River Shannon SAC and River Shannon and Fergus SPA. However, mitigation measures have been detailed that will avoid significant negative impacts on the key sensitive receptors (Lamprey, Salmonids and Cetaceans) and other qualifying features of the European sites. On this basis, permission was granted for both applications in 2014.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

It is considered that the proposed Foynes Island marine SI works would have no potential to act in-combination with this project.

5.2.11 Aughinish Alumina Jetty Dumping at Sea Permit

The proposal is for maintenance dredging of clean sediment from four sites around the Aughinish Alumina Jetty and subsequent dumping of dredged material in the Shannon Estuary. The nearest dump site to the proposed Foynes Island SI works is located approximately 1km northwest. The proposal, applied for in November 2023, and was permitted in June 2025 (S0026-02). The application has been accompanied by a Natura Impact Statement which outlines mitigation measures such as monitoring by marine mammal observer to minimise the risk of disturbance to the population of bottlenose dolphins associated with the Lower River Shannon SAC. Provided all the recommended mitigation measures are implemented, it was concluded that there would be no adverse effects on the Lower River Shannon SAC or the River Shannon and River Fergus Estuaries SPA.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

On this basis it is considered that this proposal would have no potential to give rise to any in-combination effects alongside the proposed Foynes Island marine SI works.

5.2.12 Tarbert Offshore Wind Farm

This project involves site investigation works to consider the substrate stability, suitability for cable routing and positioning of turbines and other electrical infrastructure for the proposed development of the Offshore Wind Farm off the coast of counties Clare, Limerick and Kerry. A Natura Impact Assessment has been produced and accompanies the Foreshore Licence Application. The Foreshore Licence area is located approximately 15km west of the proposed Foynes Island SI works. Potential likely significant effects on common bottlenose dolphin from underwater noise disturbances, on reefs from pressure disturbance and on overwintering birds were identified. The NIS concludes that with the implementation of mitigation measures, including timing of works outside the wintering period, any impacts on the conservation objectives of the Lower River Shannon SAC, and the River Shannon and River Fergus Estuaries SPA will be avoided.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

On this basis it is considered highly likely that this project will have no potential to act in combination with the proposed Foynes Island marine SI works.

5.2.13 SFPC Maintenance Dredging Dumping at Sea Permit

Shannon Port Company has applied for a Foreshore Licence and Dumping at Sea Permit (S0009-03) for maintenance dredging at Limerick Docks, the approach channel to Limerick Docks and at Foynes Port. The Dumping at Sea Permit states that all loading and dumping activities shall be completed by 31st December 2026. Two sites in the inner estuary and a single site in the main channel of the estuary, west of Foynes, are the proposed dump sites. These works are located within approximately 1km of the proposed Foynes island SI works.

The proposal has been subject to appropriate assessment where mitigation measures were outlined to avoid the potential likely significant effects on Annex II marine mammals as a result of underwater noise disturbance of 18 European sites and the risk of entrainment for migratory fish of the Lower River Shannon SAC during dredging. The appropriate assessment concluded that with adherence to mitigation measures, the project will not have a significant effect on European sites. Permission has been granted as of June 2023.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

On this basis it is considered that this proposal would have no potential to give rise to any in-combination effects alongside the proposed Foynes Island marine SI works.

5.2.14 Foynes to Limerick Road

An application (file ABP-306146-19) has been made to An Bord Pleanála by Limerick City and County Council, as the Roads Authority, for the proposed development 'Foynes to Limerick Road (including the Adare Bypass)' including all ancillary and consequential works. A second application (file ABP-306199-19) was submitted seeking approval of three road schemes. The project was approved with conditions in August 2022.

The proposed project comprises 399ha of lands and generally follows a linear route located predominantly in rural County Limerick located close to the communities of Foynes, Askeaton, Rathkeale, Croagh, Adare and Patrickswell. The new road starts from the N69 at Shannon-Foynes port, located approximately 1.5km from the proposed Foynes Island SI works area.

Screening for appropriate assessment determined the development to likely result in significant effects on the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA with uncertainty regarding possible impacts on Curraghchase Woods SAC and Askeaton Fen Complex SAC. Appropriate Assessment informed by a NIS concluded that this development would not adversely affect any European sites following the implementation of mitigation to prevent any deterioration in water quality and to maintain habitat connectivity.

All pathways for adverse likely significant effects outlined within this report will be mitigated for using the methods outlined in Section 5.3 Mitigation Measures, screening out any pathways for potential impacts on any nearby European site by the proposed Marine SI Works (Site C & D).

On this basis it is considered that this proposal would have no potential to give rise to any in-combination effects alongside the proposed Foynes Island marine SI works.

5.2.15 Marine SI Works (Site A & B)

An application for a MUL was submitted by SFPC for Marine Site Investigation Works in March 2024, with that application being supported by a report to inform Screening for Appropriate Assessment and a Natura Impact Statement. The MUL was subsequently granted (Ref: 230014) in October 2024 and the survey campaign commenced shortly thereafter. The scope of the works included under the original MUL includes areas directly adjacent to the areas for which the amendment to the MUL is being sought and for which this NIS has been prepared (Site C & D) and follows the same methodology as those outlined above in Section 3 Proposed Development.

The potential for likely significant effects upon the qualifying features of the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA through accidental pollution injury and disturbance from underwater noise and visual disturbance was identified in the screening assessment.

The NIS associated with MUL Ref: LIC230014)outlined various mitigation measures to be implemented such as the use of marine mammal observers (MMO), soft start and ramp-up procedures to allow marine mammals to move outside the area of ensonification before noise reaches injury levels, slow vessel movements through the application area and short-term presence of vessels in proximity to nesting sites. The assessment concluded that the measures proposed and adopted would ensure that the proposed surveys would not undermine the conservation objectives of the sites concerned, and as such will not adversely affect the integrity of any European site.

During the execution of the marine survey campaign associated with LIC230014, all mitigation measures were implemented and regular MMO reporting submitted to NPWS as required. No adverse effects upon the integrity of any European site occurred. That element of the marine survey campaign designed to inform preliminary design of FIDD Project was completed early in 2025. The future phase of the survey campaign under LIC230014, intended to inform detailed design of the FIDD Project ahead of construction phase, will not occur for a number of years.

When the timing of the already completed survey activities of Phase 1 of MUL LIC230014 are considered in combination with the future survey activities under Phase 2 of MUL LIC230014 and along with the survey activities associated with the proposed amendment, the result is that the same magnitudes of underwater noise are predicted, but they will occur across three campaigns within a seven year period rather than occurring across two campaigns within a seven year period. The temporal scale of these effects is increased. The magnitude of the underwater noise effect is predicted to remain the same in combination with activities already licenced under MUL LIC230014 as it is as a result of the proposed development alone. Given the measures to be applied to the sound producing activities which are intended to avoid or reduce this effect on the marine mammals, and the minimal impacts predicted to arise as a result of the proposed works, the extended temporal duration is not significant. No additional effects occur cumulatively or in combination in this regard.

5.2.16 Gas Networks Ireland Site Investigation

The proposed surveys are intended to gather reliable baseline data for site selection, project design, development, and the EIA. The Site Investigation works include marine and intertidal surveys, geophysical and geotechnical investigations, archaeological checks, and metocean monitoring. Sampling locations are indicative only and may change on site, with the data helping to inform a potential jetty, vessel access, and possible pipeline routes from Foynes Island to the mainland.

It was concluded that the surveys will not adversely affect the integrity of any European sites, in view of the sites' conservation objectives, subject to the implementation of the mitigation measures, which were included as conditions to the MUL consent. In particular, this includes:

- Prior to the commencement of the Permitted Maritime Usage, the Holder shall coordinate with other authorisation holders carrying out geophysical, seismic and geotechnical activities within a 20 km radius of the site boundary.
- Where a vessel-to-vessel distance of greater than 20 km cannot be maintained with respect to geophysical, seismic and geotechnical activities, the Holder shall co ordinate with other authorisation holders to prevent temporal overlap of the activities. Where the Holder can submit evidence that there is a vessel-to-vessel distance of greater than 20 km, no temporal co-ordination of activities is required.
- Where the Holder becomes aware of temporal overlap that cannot be resolved within the prescribed distance, the Holder shall notify the Grantor who shall determine the timing of activities.
- Records of all engagements held, and agreements reached, if any, shall be maintained by the Holder and made available to the Grantor if requested.

These conditions would potentially be relevant to the Proposed Development as the SI activities proposed by SFPC as they are within 20 km of this project. This would require co-ordination with Gas Networks Ireland to ensure there is no temporal overlap in order for them to proceed with the site investigation in a manner that complies with their licence conditions.

On this basis that this mitigation is adhered to, it is considered that this proposal would have no potential to give rise to any in-combination effects alongside the proposed Foynes Island marine SI works.

5.2.17 Uisce Éireann Sewerage Scheme

Uisce Éireann was granted permission to upgrade wastewater infrastructure at Foynes, County Limerick. The proposed works include the construction, use, operation and maintenance of wastewater infrastructure, including all associated decommissioning, demolition, rehabilitation, and any other works required on foot of any development permission relating to the infrastructure.

The NIS recommended a series of mitigations in order to mitigate any likely significant effect upon the QIs of Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA. This mitigation included:

- Fuel and Oil Spill Prevention;
- Suspended Solids Mitigation;
- Dust control;
- Biosecurity measures; and
- Use of an MMO.

Most critically, dredging will be scheduled to avoid temporal overlap within a radius of 5km with any additional underwater noise inducing projects, and construction works in the intertidal zone will be restricted to between May and September to avoid disturbance of wintering flocks.

On this basis that this mitigation is adhered to, it is considered that this proposal would have no potential to give rise to any in-combination effects alongside the proposed Foynes Island marine SI works.

5.2.18 Aughinish Alumina Bauxite Extension

The proposed development includes enlarging the Bauxite Residue Disposal Area to increase disposal capacity and raise its height by about 12m, without expanding its footprint. It also includes raising the Salt Cake Disposal Cell by about 2.25m, extending the borrow pit from 4.5ha to 8.4ha to provide more rock fill, continuing use of a topsoil stockpile area for restoration works, and upgrading water management infrastructure to support the BRDA and improve flood capacity.

This proposal has been accompanied by a Natura Impact Statement which identified the potential for likely significant effects upon the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA.

Subject to the implementation of a range of mitigation measures, it is concluded that this proposal will not give rise to any adverse effects upon the integrity of any European sites and as such will not have the potential to give rise to any in-combination effects alongside the proposed Foynes Island marine SI works.

5.3 Mitigation Measures

The Proposed Development will incorporate a range of measures to address the following identified potential adverse effects upon the integrity of the following European sites:

- Adverse habitat loss effects on Annex I reef habitat.
- Adverse water quality and habitat deterioration and oiling effects arising through pollution events upon the following European Sites:
 - Lower River Shannon SAC; and
 - River Shannon and River Fergus Estuaries SPA.
- Adverse underwater noise and vibration effects upon marine mammals, including common bottlenose dolphin, harbour porpoise and grey seal upon the following European Sites:
 - Lower River Shannon SAC [002165]
 - Blasket Islands SAC [002172]
 - Slyne Head Islands SAC [000328]
 - Slyne Head Peninsula SAC [002074]
 - West Connacht Coast SAC [002998]
 - Duvillaun Islands SAC [000495]
 - Kenmare River SAC [002158]
 - Roaringwater Bay and Islands SAC [000101]
 - River Shannon and River Foynes Estuaries SPA [004077]

The proposed factored in measures and mitigation measures are set out below in Table 5-8.

Table 5-8: Factored-in measures and mitigation commitments

Effect Theme	Potential Effect	Control and Mitigation Measures
Loss of or damage to Annex I reef habitat	Unintentional damage to reef habitat or deterioration of any marine biological community comprising a community type of the Annex I reef habitat	No borehole activity shall take place in Reef habitat (EU Annex 1 habitat code 1170). All borehole activity shall be undertaken under the direct supervision of a suitably qualified person or persons with appropriate geophysical and/or benthic ecology experience in identifying Reef habitat, who shall be present on the survey vessel/drill rig during borehole activity and who shall be empowered to halt such borehole activity where necessary to protect Reef habitat.
Water Quality/ Pollution/ Oiling risk	- Oil spills from plant, machinery and equipment used in the surveys - Acute toxicity effects on marine fauna from fuel and oil spills - Deterioration to Annex I marine and estuarine habitats from fuel and oil spills	- All hazardous substances to be stored in a dedicated storage room - Substances categorized as "Danger" will be stored in a locker and may only be used with a Permit To Work - Updated MSDS will be readily accessible in storage rooms - The amount of hazardous material is kept to a minimum - Hazardous substances stored, handled and disposed of in accordance with the regulations in force - All storage facilities and handling equipment will be in good working order and designed in such a way as to prevent and contain any spillage as far as practicable - Use appropriate and certified hoses only - Procedures in case of bunkering, spillage, SOPEP, discussed in a toolbox before each bunker operation - Identified personnel trained in the use of equipment - Regular drills - Spill kits located near hydrocarbon storage areas and replenished if required.
Underwater Noise and Vibration	Auditory injury and/or disturbance to marine mammals from underwater noise during geophysical surveys.	<i>Geophysical Survey Marine Mammal Mitigation Plan: In line with previous geophysical surveys for the project the following mitigation measures will be employed for any geophysical surveys in line with best practice guidance (NPWS, 2014):</i> - A qualified Marine Mammal Observer (MMO) will be on board the geophysical survey vessel to monitor marine mammal activity and log all events; - Pre-start monitoring: Geophysical survey operations shall not commence if marine mammals are detected within a 350 m radial distance of the vessel (a conservative range which accounts for the maximum likely zone of influence for potential injury from geophysical surveys of 130 m); - Survey operations shall only commence in daylight hours where effective visual monitoring by the MMOs has been achieved. Where effective visual monitoring is not possible, the sound-producing activities shall be postponed until effective visual monitoring has been completed; - Ramp Up: Following the pre-start monitoring, a ramp-up procedure will involve, for a period of 4 minutes all geophysical equipment, with the exception of the air-guns, will be powered on. Once the 4 minute period soft-start has lapsed, the air gun will be activated; - Where the duration of a survey line or station change will be greater than 40 minutes, the activity shall, on completion of the line/station being surveyed, either shut down and undertake a full pre-start monitoring and ramp-

Effect Theme	Potential Effect	Control and Mitigation Measures
		up procedure or reduce the sound energy output to a lower state with an output peak SPL of 165-170 dB re 1µPa @1m, and then undertake the full ramp up procedure; • If there is a break in sound output for a period of 5 - 10 minutes the MMO will be required to check that no marine mammals are observed within the monitored zone prior to recommencement of the sound sources at full power. Where a marine mammal is observed within the 350 m monitored zone during such a break, then all pre-start monitoring and a subsequent ramp-up procedure shall recommence as in a normal start-up operation; and • If there is a break in sound output for a period greater than 10 minutes, then all pre-start monitoring and a subsequent ramp-up procedure will be undertaken.

5.3.1 Residual Impacts

With the effective implementation of appropriate mitigation measures identified in this NIS as set out above, the Project poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the QIs and SCIs of the SAC's and SPAs outlined in section 4. There are therefore no residual direct or indirect impacts associated with the Project that could adversely affect the integrity of any designated site.

6 CONCLUSION OF THE HABITATS DIRECTIVE APPRAISALS

6.1 Screening for Appropriate Assessment

Having regard to the relevant legislation and the methodology followed, supporting information for Screening for Appropriate Assessment was presented to evaluate whether or not the Proposed Project is likely to have an adverse effect on the integrity on the SACs and SPAs outlined in [Table 4-1](#).

LSEs could not be excluded at screening stage for ten European sites, without further analysis or the application of measures intended to avoid or reduce the harmful effects of the proposed site survey activities on the sites concerned.

The possibility of habitat loss on the following could not be excluded for:

- Annex I Habitats of the Lower River Shannon SAC; and
- Qualifying wetland habitats of the River Shannon and River Fergus Estuaries SPA.

The possibility of likely significant water quality and subsequent habitat deterioration effects on the following could not be excluded:

- Annex I Habitats and Annex II Species of the Lower River Shannon SAC;
- SCI bird populations of the River Shannon and River Fergus Estuaries SPA;

The possibility of likely underwater noise and vibrational disturbance effects upon Annex II Species on the following could not be excluded:

- Lower River Shannon SAC (sea lamprey, brook lamprey, river lamprey, salmon, common bottlenose dolphin and otter).
- Blasket Islands SAC (harbour porpoise and grey seal).
- Slyne Head Islands SAC (common bottlenose dolphin and grey seal).
- Slyne Head Peninsula SAC (common bottlenose dolphin).
- West Coast Connacht SAC (common bottlenose dolphin and harbour porpoise).
- Duvillaun Islands SAC (common bottlenose dolphin).
- Kenmare River SAC (harbour porpoise).
- Roaringwater Bay and Islands SAC (harbour porpoise).

The possibility of likely significant aerial noise and visual disturbance effects on the following could not be excluded:

- SCI bird populations of the River Shannon and River Fergus Estuaries SPA;
- Annex II species populations (otter) of the Lower River Shannon SAC.

6.2 Natura Impact Statement

A NIS of the implications of the Proposed Project on European sites was prepared and which included for further assessment of the potential effects and receptors in addition to the introduction of measures intended to avoid or reduce the harmful effects of the proposed site survey activities on European sites, and these measures are set out at Section 5.3.

Further assessment provided sufficient certainty (beyond reasonable scientific doubt) that the Proposed Development would not give rise to adverse effects upon the integrity of the relevant European sites via the respective pathway for effect:

- Habitat loss effects upon estuary, mudflat & sandflat habitat types in the Lower River Shannon SAC;
- Habitat loss effects upon the River Shannon and River Fergus Estuaries SPA;
- Aerial noise and visual disturbance effects upon the Lower River Shannon SAC (otter); and
- Aerial noise and visual disturbance effects upon the River Shannon and River Fergus Estuaries SPA.

The NIS has identified that the Proposed Development would have the potential to give rise to adverse impacts upon the integrity of a number of European sites in the absence of mitigation measures as follows:

- Habitat Loss effects on Reef habitat within the Lower River Shannon SAC;
- Water quality and habitat deterioration effects upon the Lower River Shannon SAC;
- Water quality and habitat deterioration effects upon the River Shannon and River Fergus Estuaries SPA;
- Underwater noise and vibration effects upon the Lower River Shannon SAC;
- Underwater noise and vibration effects upon the Blasket Islands SAC;
- Underwater noise and vibration effects upon the Slyne Head Islands SAC;
- Underwater noise and vibration effects upon the Slyne Head Peninsula SAC;
- Underwater noise and vibration effects upon the West Connacht Coast SAC;
- Underwater noise and vibration effects upon the Duvillaun Islands SAC;
- Underwater noise and vibration effects upon the Kenmare River SAC; and
- Underwater noise and vibration effects upon the Roaringwater Bay and Islands SAC.

Measures will be put in place to ensure that effects arising through habitat loss, water quality and habitat deterioration effects and potential for underwater noise and vibration effects will effectively mitigate these potential adverse impacts and ensure that they will not adversely affect the integrity of any European site.

Accordingly, for the reasons set out in detail, in the light of the best scientific knowledge in the field, all aspects of the proposed site survey activities which, by themselves, or in combination with other plans or projects, may affect the relevant European Sites have been considered. This report contains information which the Department and the Minister may consider in making their own complete, precise and definitive findings and conclusions and upon which the public authority can determine that all reasonable scientific doubt has been removed as to the effects of the proposed development on the integrity of the relevant European sites.

In the light of the conclusions of the assessment which it shall conduct on the implications for the European sites concerned, the relevant public authority is enabled to ascertain that the proposed site survey activities will not adversely affect the integrity of any European site.

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