Prepared by
Roughan & O'Donovan
Dublin | Leeds | Cork
www.rod.ie

IRISH NATIONAL HERITAGE PARK

GROUND INVESTIGATION WORKS AND ENVIRONMENTAL SURVEYS

Natura Impact Statement

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Client
Wexford County Council
County Hall,
Carricklawn,
Wexford,
Y35 WY93

ROD
ROUGHAN & O'DONOVAN

Irish National Heritage Park - Ground Investigation Works and Environmental Surveys

Natura Impact Statement

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1. INTRODUCTION

1.1 Summary

Roughan & O'Donovan (ROD) was appointed by Wexford County Council (WCC) to prepare a Natura Impact Statement (NIS) in support of a licence application to the Maritime Area Regulatory Authority (MARA), for maritime usage. The subject of the licence application is proposed ground investigation (GI) works and marine environmental surveys to inform the design of the proposed Irish National Heritage Park in Co. Wexford. The GI works and environmental surveys are collectively referred to as "the proposed works".

As part of the maritime usage licence application, a Supporting Information for Screening for Appropriate Assessment (SISAA) Report has been submitted. The SISAA Report is essentially an Appropriate Assessment (AA) Screening Report and serves the same function. The SISAA Report was intended to determine whether or not the GI works and the environmental surveys, either individually or in combination with other plans or projects, in view of best scientific knowledge, are likely to have a significant effect on areas designated as being of European importance for nature conservation ("European sites"), thereby enabling MARA, as the Competent Authority in this case, to fulfil its obligations under Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora ("the Habitats Directive"). The report concluded that 'on the basis of objective information, that the works, either individually or in combination with other plans or projects, in view of best scientific knowledge, are likely to give rise to impacts which would constitute significant effects in view of the Conservation Objectives of any European site'.

This document comprises the NIS in respect of the GI works and environmental surveys, together referred to as 'the proposed works' and has been prepared by ROD on behalf of WCC. It contains an examination, analysis and evaluation of the likely impacts from the proposed works, both individually and in combination with other plans and projects, in view of best scientific knowledge and the Conservation Objectives of the European sites concerned. It also prescribes appropriate mitigation to ensure that the proposed works will not adversely affect the integrity of those sites. Finally, it provides complete, precise and definitive findings which are capable of removing all reasonable scientific doubt as to the absence of adverse effects on the integrity of the European sites concerned and sets out detailed reasons which explains the basis for such findings.

1.2 Competent Experts

This Natura Impact Statement was prepared by Patrick O'Shea and Síofra Sealy. Patrick is a Principal Ecologist with over 13 years' experience in ecological assessment. He holds a degree in Botany from Trinity College Dublin and an MSc in Ecological Management and Conservation Biology from Queen's University Belfast. Patrick is a Full member of the Chartered Institute of Ecological and Environmental Management (CIEEM).

Síofra is a Senior Ecologist with more than seven years' experience in ecological consultancy. She holds a BA (Hons) degree in Natural Sciences (Zoology) from Trinity College Dublin and is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).

1.3 Legislative Context

Council Directive 92/43/EEC of the 21st May 1992 on the conservation of natural habitats of wild fauna and flora ("the Habitats Directive") and Directive 2009/147/EC of the European Parliament and of the Council of the 30th November 2009 on the conservation of wild birds ("the Birds Directive") list habitats and species which are important for conservation and in need of protection. This protection is afforded in part through the designation of sites which support significant examples of habitats or populations of species ("European sites"). Sites designated for birds are termed "Special Protection Areas" (SPAs) and sites designated for natural habitat types or other species are termed "Special Areas of Conservation" (SACs). The complete network of European sites is referred to as "Natura 2000".

In order to ensure the protection of European sites in the context of land use planning and development, Article 6(3) of the Habitats Directive provides for the assessment of the implications of plans and projects for European sites, as follows:

> "*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[1] 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."*

In *Case C-323/17* [§34*], People Over Wind*, the Court of Justice of the European Union ('the CJEU') referred to the nature of the test to be applied in making a screening determination as follows:

> *"[...] it is settled case-law that Article 6(3) of the Habitats Directive makes the requirement for an appropriate assessment of the implications of a plan or project conditional on there being a probability or a risk that the plan or project in question will have a significant effect on the site concerned. In the light, in particular, of the precautionary principle, such a risk exists if it cannot be excluded on the basis of objective information that the plan or project will have a significant effect on the site concerned (judgment of 26 May 2011, Commission v Belgium, C538/09, EU:C:2011:349, paragraph 39 and the case-law cited). The assessment of that risk must be made in the light inter alia of the characteristics and specific environmental conditions of the site concerned by such a plan or project (see, to that effect, judgment of 21 July 2016, Orleans and Others, C387/15 and C388/15, EU:C:2016:583, paragraph 45 and the case-law cited)."*

Further clarification on the use of mitigation measures was provided in *Eco Advocacy*[2], where the CJEU ruled that where constituent elements are incorporated into the design of a project as standard features required for all projects of that nature and not with the aim of reducing negative effects of a project on European sites, those features cannot be regarded as indicative of likely significant effects on European sites concerned and should not be interpreted as mitigation measures intended to avoid or reduce harmful effects of a plan or project on those European sites.

[1] Including, where applicable, 'sites'.
2 Eco Advocacy v. An Bord Pleanála [2023] C-721/21

The judgment stated that:

> "*In the light of the foregoing considerations, the answer to the fourth question is that Article 6(3) of the 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 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*."

Article 7 of the Habitats Directive provides that the provisions of, inter alia, Article 6(3) are to apply to SPAs under Directive 2009/147/EC (the "Birds Directive").

The requirements arising out of Article 6(3) of the Habitats Directive are transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 as amended[3] (S.I. No.477 of 2011) (the Habitats Regulations), including Part 5 thereof.

The determination of whether or not a plan or project requires AA is referred to as "Stage 1" or "AA Screening". A "Stage 1" or "AA Screening" is completed to determine whether or not the proposed works, either individually or in combination with other plans or projects, in view of best scientific knowledge, is likely to have a significant effect on areas designated as being of European importance for nature conservation ("European sites"), thereby enabling the Applicant, to fulfil its obligations under Article 6(3) of the Habitats Directive.

The first threshold is reached if the plan or project is not directly connected with or necessary to the management of one or more European sites. In its ruling in *Waddenzee*[4], the Court of Justice of the European Union (CJEU) interpreted the second threshold as being reached where "*it cannot be excluded, on the basis of objective information, that* [the plan or project] *will have a significant effects on European sites*". Thus, in applying the Precautionary Principle, the CJEU interpreted the word "likely" to mean that, as long as it cannot be demonstrated that an effect will not occur, that effect is considered "likely". A likely effect is considered to be "significant" only if it interrupts or causes a delay in achieving the Conservation Objectives of the site concerned[5].

Prior to approval of a plan or project which is the subject of AA (also referred to as "Stage 2"), it is necessary to "*ascertain*" that the plan or project will not "*adversely affect the integrity of the site*". In its guidance document (EC, 2018), the European Commission stated that "*the integrity of a site involves its constitutive characteristics and ecological functions*" and that "*the decision as to whether it is adversely affected should focus on and be limited to the habitats and species for which the site has been designated and the site's conservation objectives*". Regarding the word "ascertain", the CJEU, also in *Waddenzee*, interpreted this as meaning "*where no reasonable scientific doubt remains as to the absence of such effects*". Therefore, the legal test at Stage 2 is satisfied (and the plan or project may be authorised) when it can be demonstrated beyond reasonable scientific doubt that the plan or project will not interrupt or cause delays in the achievement of the Conservation Objectives of the site or sites concerned. AA is informed by a "Natura Impact Report" (NIR) in the case of plans or a "Natura Impact Statement" (NIS) in the case of projects.

[3] Including inter alia S.I. 290 of 2013; SI 499 of 2013; SI 355 of 2015; the Planning, Heritage and Broadcasting (Amendment) Act 2021, Chapter 4; SI 293 of 2021.

[4] Landelijke Vereniging tot Behoud van de Waddenzee, Nederlandse vereniging tot Bescherming van Vogels *v.* Staatssecretaris van Landbouw, Naturbeheer en Visserij (Waddenzee) [2004] C-127/02 ECR I-7405.

[5] Conservation Objectives are referred to, but not defined, in the Habitats Directive. In Ireland, Conservation Objectives are set for Qualifying Interests (the birds, habitats or other species for which a given European site is selected) and represent the overall target that must be met for that Qualifying Interest to reach or maintain favourable conservation condition in that site and contribute to its favourable conservation status nationally.

The CJEU has made a relevant judgment on what information should be contained within documents supporting AA[6] (in the NIR or NIS):

> *"[The AA] cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the proposed development proposed on the protected site concerned."*

The High Court and Supreme Court[7] have also provided clarity on how competent authorities should undertake AA[8] and has stated that the following four matters require to be addressed:

- First, an appropriate assessment must identify, in the light of the best scientific knowledge in the field, all aspects of the development project which can, by itself or in combination with other plans or projects, affect (a) European site(s) in the light of its conservation objectives;
- Second, there must be complete, precise and definitive findings and conclusions regarding the previously identified potential effects on any relevant European site(s) this and may not have lacunae or gaps. The requirement for precise and definitive findings and conclusions requires analysis, evaluation and decisions. Further, the reference to findings and conclusions in a scientific context requires both findings following analysis and conclusions following an evaluation each in the light of the best scientific knowledge in the field;
- Third, on the basis of those findings and conclusions, the Competent Authority (here MARA) must be able to determine that no scientific doubt remains as to the absence of the identified potential effects;
- Fourth, where the aforesaid three requirements are satisfied, MARA may determine that the proposed works will not adversely affect the integrity of any relevant European site. Accordingly, an appropriate assessment may only include a determination that the proposed works will not adversely affect the integrity of any relevant European site where upon the basis of complete, precise and definitive findings and conclusions made, MARA decides that no reasonable scientific doubt remains as to the absence of the identified potential effects.

In accordance with Regulation 42 of the Habitats Regulations, AA must be undertaken by the competent authorities. In Ireland, the competent authority is the relevant public authority for each plan or project (as defined in Part 1 of the Habitats Regulations), in this case MARA. Consequently, the responsibility for carrying out AA lies solely with the competent authority. In that respect, the NIS is not in itself an Appropriate Assessment but provides the competent authority with the information required to carry out its AA.

[6] *Sweetman v. An Bord Pleanála* [2013] Case C-258/11.
[7] See *Kelly (Eoin) v An Bord Pleanála* [2014] I.E.H.C. 400 where the High Court (Finlay Geoghegan J.) held that section 177V(1) of the Planning and Development Act 2000 (as amended) must be construed so as to give effect to Article 6(3) of the Habitats Directive, and hence, an appropriate assessment carried out under section 177V(1) of the 2000 Act must meet the requirements of Article 6(3) of the Habitats Directive as interpreted by jurisprudence of the CJEU case law; *Connelly v An Bord Pleanála* [2018] 2 I.L.R.M 453; [2018] I.E.S.C. 31.
[8] *Kelly v. An Bord Pleanála* [2014] IEHC 422.

1.4 Maritime Area Planning Legislation

In December 2021, the Government passed the Maritime Area Planning (MAP) Act, 2021 to regulate the maritime area. The MAP Act will achieve this through the National Marine Planning Framework, maritime area consents for the occupation of the maritime area for the purposes of maritime usages for undefined or long periods of time, and licences for marine usages for a relatively short periods of time. The Maritime Area Regulatory Authority (MARA) has been established to oversee the enforcement of this Act. As part of this role, MARA will review applications for consents and licences within the maritime area.

The proposed works are located in a maritime area and are required to inform the design of the Irish National Heritage Park. The proposed works fall under Schedule 7(3) of the MAP Act, 2021 relating to the 'Maritime Usages which may be undertaken in Maritime Area pursuant to Licence':

> "*3. Marine environmental surveys for the purposes of site investigation or in support of an application under Part XXI of the Act of 2000*".

In accordance with the Act, the proposed works are required to hold a valid licence prior to their commencement.

This NIS has been prepared to inform the licence application for the ground investigation works and environmental surveys in accordance with the MARA Applicant Technical Guidance Note (2023).

1.5 Methodology

In accordance with the requirements for AA, this NIS assesses the likely effects of the proposed works on the integrity of the European sites "screened in" at Stage 1. This assessment is undertaken in six steps, as follows:

1. Step 1 involves gathering all of the information and data that will be necessary for a full and proper assessment. These include, but are not limited to, the details of all phases of the plan or project, environmental data pertaining to the area in which the plan or project is located, e.g., rare or protected habitats and species or invasive species present or likely to be present, and the details of the European sites within the zone of influence.
2. Step 2 involves examination of the information gathered in the first step and detailed scientific analysis of the effects of the plan or project on the ecological structure and function of the receiving environment, focussing on European sites.
3. Step 3 evaluates the effects analysed in Step 2 against the Conservation Objectives of the relevant European site or sites, thereby determining whether or not they constitute adverse effects on site integrity.
4. Having established that the plan or project will adversely affect the integrity of one or more European sites, Step 4 involves the development of appropriate mitigation, including, where appropriate, monitoring and enforcement measures, to eliminate or minimise those effects such that they no longer constitute adverse effects on the integrity of the site(s) concerned, as well as consideration of the significance of any residual (post-mitigation) effects.
5. Step 5 involved the assessment of the significance of any residual effects arising from the proposed works in combination with other plans or projects.

6. Step 6 involves the final determination of whether or not the plan or project will adversely affect the integrity of one or more European sites. Notwithstanding the final recommendation made in the NIS, the responsibility for completing this step lies solely with the Competent Authority.

The following guidance documents informed the assessment methodology:

- Department of Arts, Heritage and the Gaeltacht (DAHG) (2014) *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters.* Department of Arts, Heritage and the Gaeltacht, Dublin.
- Department of Environment, Heritage, and Local Government (DEHLG) (2010) *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities*. Department of the Environment, Heritage and Local Government, Dublin.
- Department of the Environment, Heritage and Local Government (DEHLG) (2007) *Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters.* Department of the Environment, Heritage and Local Government, Dublin.
- European Commission (EC) (2021) *Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. Environment Directorate-General of the European Commission.
- European Commission (EC) (2018) *Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*. European Commission, Brussels.
- European Commission (EC) (2007) *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 European Commission.
- Maritime Area Regulatory Authority (MARA) (2023) *Obtaining a Licence to Carry Out Specified Maritime Usages in the Maritime Area under the Maritime Area Planning Act 2021: Applicant Technical Guidance Note.* Maritime Area Regulatory Authority, Wexford.
- National Parks and Wildlife Service (NPWS) (2010) *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities*. Circular Letter NPW 1/10 & PSSP 2/10. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.
- Office of the Planning Regulator (OPR) (2021) *Practice Note PN01: Appropriate Assessment Screening for Development Management.* Office of the Planning Regulator.

1.6 Ecological Assessment

In order to fully inform this NIS, it was necessary to establish the baseline ecological conditions in the receiving environment, particularly with regard to European sites. This was achieved by undertaking desktop studies, carrying out field surveys and engaging in consultations with the relevant stakeholders, including the National Parks & Wildlife Service (NPWS) and Inland Fisheries Ireland (IFI).

1.6.1 Desk Study

During the desk study, the statutory consultee, the National Parks & Wildlife Service (NPWS), provided data on designations of sites, habitats and species of conservation interest. This included reports pursuant to Article 17 of the Habitats Directive[9] (NPWS, 2025a, b, c) and Article 12 of the Birds Directive (Eionet, 2018)[10], as well as the Site Synopses, and Conservation Objectives (including supporting documents) for the relevant European sites.

The desk study involved thorough reviews of existing information relating to ecology in the vicinity of the proposed works. A number of web-based geographic information systems (GISs) were used to obtain information relating to the natural environment surrounding the proposed works. These included the NPWS *Map Viewer* (NPWS, 2024), which provided information on the locations of protected sites, the National Biodiversity Data Centre's *Biodiversity Maps* (NBDC, 2024), which provided recent and historic records of protected species in the area, and Ordnance Survey Ireland's *GeoHive*, which provided additional information on the wider environment. Only species that are relevant to this NIS are included in Section 2.5

As with all desk studies, the data considered were only as good as the data supplied by the recorders and recording schemes. The recording schemes provide disclaimers in relation to the quality and quantity of the data they provide, and these were considered when examining outputs of the desk study.

1.6.2 Field Surveys

Ecological field surveys have been undertaken at the proposed Irish National Heritage Park by ROD Ecologist at various dates since 2020.

The surveys adhered to the following guidelines:

- *Ecological Survey Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (TII, 2008).
- *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes* (TII, 2006).
- *Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes* (TII, 2005).
- *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (TII, 2009).
- *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al., 2011).

The surveys with relevance to this AA Screening Report are described below.

[9] Under Article 17, to report to the European Commission every six years on their status and on the implementation of the measures taken under the Directive.
[10] Every three years, Member States of the European Union are required by Article 12 of the Birds Directive to report on implementation of the Directive. The most recent reporting available is for the period 2008-2012.

Habitats

A habitat survey for the proposed Irish National Heritage Park was undertaken at on the 19th April 2024. Habitats were classified in accordance with A Guide to Habitats in Ireland (Fossitt, 2000) and mapped following Smith et al. (2011). The study area for the habitat surveys included the proposed Irish National Heritage Park land plus the estuarine habitats to the north, where accessible. The study area was systematically and thoroughly walked, and all habitats were classified and sketched onto maps. Any Fossitt habitats with links to Annex I habitats were examined further to determine if they corresponded to Annex I habitat. The presence of Annex I habitats, or otherwise, was confirmed using the Interpretation Manual of European Union Habitats (EC, 2013).

Otter

An Otter survey for the proposed Irish National Heritage Park was conducted on the 19th April 2024 and 4th December 2025 adhering to best practice guidelines (TII, 2006 & 2008). The study area for otters included accessible areas along the southern bank of the River Slaney and the woodlands and scrub habitat on the northern side of the R730. The survey involved a search for signs of otter activity (prints, spraints, trails, holts, couches, slides, feeding remains etc.).

Wintering Birds

Monthly wintering bird surveys were conducted for the proposed Irish National Heritage Park from October 2020 – April 2021 and October 2023 – April 2024. The surveys were undertaken from six locations along the southern bank of the estuary and included the estuary upstream and downstream of Ferrycarrig Bridge. All wintering bird species were recorded using a 'look-see' approach (Bibby et al., 2012). Survey methodology followed Gilbert et al. (1998) and the Irish Wetland Bird Survey. All species recorded were classified according to British Trust for Ornithology (BTO) species codes. For each observation, the date, time, site, species, number of birds, position, activity and any other notes of interest were recorded.

1.6.3 Assessment

The ecological baseline which was established by the desk study described above was used to inform the assessment of the potential ecological effects likely to arise from the environmental surveys and the proposed works, particularly with regard to European sites. Any assumptions that were made in view of gaps in the ecological data were made in strict accordance with the Precautionary Principle.

2. DESCRIPTION OF THE PROPOSED WORKS

2.1 Background

Wexford County Council, in conjunction with Fáilte Ireland, is committed to developing the Wexford as a tourism destination. The design of the proposed Irish National Heritage Park at Ferrycarrig, Co. Wexford aims to create, develop and incorporate a new experience '*Vikingar – Beyond Legend'* into its overall visitor experience.

The proposed works are required to inform the design of the proposed Irish National Heritage Park project, whereby three no. jetties and a man-made beach area are proposed to be installed on the southern bank of the Lower Slaney Estuary, to the north of the existing Irish National Heritage Park.

2.2 Location

The Irish National Heritage Park is located in Ferrycarrig, on the R730, northwest of Wexford town. The environmental surveys and the GI works will be undertaken within the Lower Slaney Estuary.

No alternatives have been considered for the environmental surveys and the GI works. The locations have been selected based on a preliminary review of the site location, although the exact locations may vary slightly based on the conditions of the riverbed during the time of installation.

2.3 Environmental Surveys

2.3.1 Acoustic Doppler Current Profiler (ADCP) Hydro Acoustic Survey

It is proposed to install two Acoustic Doppler Current Profiler (ADCP) Flow Meters into the Lower Slaney River Channel north of the existing Irish National Heritage Park, to measure tidal flow, speed and direction within the channel.

An ADCP is a hydroacoustic current meter similar to a sonar, used to measure water current velocities over a depth range using the Doppler effect of sound waves scattered back from particles within the water column.

The ADCPs will either be:

a) deployed in frames or bottom mounts on the riverbed, or

b) attached to a floating buoy if site conditions are not suitable for bottom mounts at installation.

Bottom mounted ADCPs will have a footprint of approx. 1.5m^2 each.

An unmanned surface vessel may also be deployed over a period of 24 hours. This process may be repeated in different parts of the tidal cycle to supplement the data collection, pending any issues with the data or if the results come back as incomplete.

The ADCPs will be deployed for a full tidal cycle (approx. 29 days) to measure water flow within the river. A substantial vessel with a winch will be required to deploy the ADCPs. The frames / bottom mounts will be selected or developed to suit the riverbed environment upon inspection, prior to the surveys being undertaken. The frames / bottom mounts will sit on the riverbed and may be held there by lead weights or other heavy weights which will be attached to the frames to keep them in place.

Each of the ADCPs may be marked with a buoy and precautions will be made to avoid damage or loss of equipment. As they will be located in shallow water, the noise emitted will likely be within the range of 600kHz – 1 MHz. The results will be saved to internal memory or output online to an external display software.

The ADCPs will be installed at the approximate locations of the blue triangles in Figure **2.1** below. The locations for the ADCPs are situated in the River Slaney, upstream of the N11 Bridge and Ferrycarrig to monitor water flow in the area. The locations of the ADCPs may move slightly on the advice from the supplier at the time of installation, depending on the conditions of the riverbed.

2.3.2 Sediment Samples

Sediments samples will be obtained at five locations within the River Slaney, as presented in Figure 2.1. These samples will be obtained using a Van Veen grab (or similar method) from a small vessel. Two surface samples of approximately 5 litres (about 15 cm penetration) in suitable sediment will be extracted at each of the five locations (total volume of 50L) and removed to a laboratory for testing. One sample from each location will undergo gradient analysis to determine the particle sizes present. The second sample will be tested to determine benthic sediment quality.

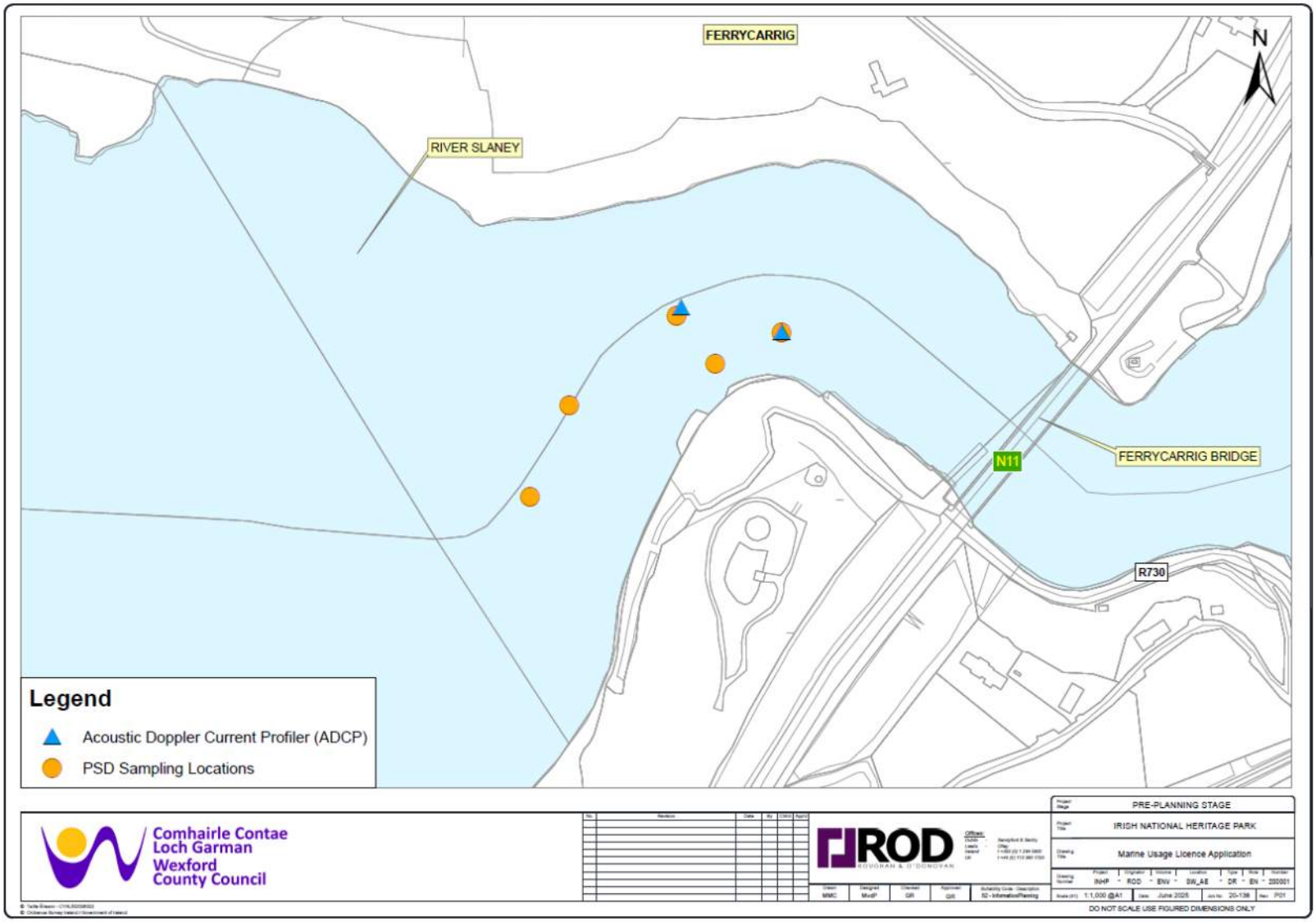

Figure 2.1 Proposed location of ADCPs and PSD samples in the Slaney Estuary.

2.4 Ground Investigations (The GI works)

2.4.1 Overview

The GI works will include five combined Cable Percussion (CP) and Rotary Core (RC) Boreholes (BH) in the river, one combined Cable Percussion and Rotary Core Borehole on land, grab sampling at five locations and geophysical surveys comprising Multi-Beam Echo Sounder, Side Scan Sonar and Sub-Bottom Profiling, as presented below in Table 2.1, Table 2.2 and Table 2.3. A piezometer will be installed as part of the land-based CP & RC to monitor groundwater levels.

2.4.2 Location

The proposed GI works will be undertaken within the tidal reaches of the River Slaney and in close proximity to the river wall along the edge of the old R730. The 5 no. in river boreholes will be carried out from a barge. Some land-based investigation works will also be required, located along the alignment of the old R730 within 10m of the existing masonry river wall. The exact locations of the proposed GI works have yet to be determined.

2.4.3 Outline of the GI works

General Layout

The scope of the GI works envisaged under this ground investigation is as follows:

a) Geophysical surveys comprising High Multi-Beam Echo Sounder survey, Side Scan Survey and Sub-Bottom Profiling techniques;

b) Shell and auger or cable percussion boreholes, sampling and *in situ* testing;

c) Vertical open hole rotary drilling, sampling and *in situ* testing;

d) Rock coring, proving rock to a specified depth and *in situ* testing;

e) Monitoring of groundwater levels in standpipes and piezometers;

f) Detailed borehole and coring;

g) Sampling to IS EN 22475-1 requirements, predominantly providing Category A samples for laboratory testing of strength and stiffness;

h) Logs as described in IS EN14688-1; IS EN1489-1; and BS5930 and the specification;

i) The ground investigation should be carried out in accordance with British Standard 10175:2001+A2:2017, Investigation of Potentially Contaminated Sites: Code of Practice and the EPA Landfill Manual: Investigations for landfill.

j) Specific sediment grab samples to be carried out for the purpose of grading analysis, contamination assessment, waste classification and offshore marine disposal of excavated spoil plus laboratory testing of soil and groundwater samples for engineering properties, behaviour and suitability for reuse as engineering fill;

k) Laboratory testing of soil and rock samples for engineering properties, behaviour and suitability;

l) Laboratory testing of soil and groundwater samples for environmental contamination, waste classification and offshore marine disposal of excavated spoil;

m) Preparation of detailed Main Factual Report as per S1.21.8 and cl 16.8 of the Specification, together with the production of Digital Data to AGS Format as per S1.21.10 and cl. 16.5;

n) Preparation of an interpretive Ground Investigation Report in accordance with IS EN1997-2, Section 6 as per S1.21.9;

o) Preparation of a Contamination Assessment Report in accordance with the EPA document '*Environmental Risk Assessment for Unregulated Waste Disposal Sites (2007)*' as per Cl 1.21.9.

p) Preparation of a Waste Classification Assessment and reporting of acceptability of materials for disposal as inert, non-hazardous or hazardous wastes to landfill facilities in accordance with the Commission Decision of 18 December 2014 and EU Commission Regulation No 1357/2014;

q) Assessment of river bottom sediment samples for potential offshore marine disposal in compliance with Marine Institute (2006) "*Guidelines for Assessment of Dredge Material for Disposal in Irish Waters*".

r) Liaison with the Wexford Harbourmaster and Waterways Ireland in respect of access, safety measures and employee training required for exploratory works within or in the vicinity of navigable waterways; and

s) Liaison and compliance with Health & Safety requirements of PSCS and general contractor.

The schedule of investigations is presented in Table 2.1, Table 2.2 and Table 2.3 below.

2.4.4 Schedule of Investigations

Table 2.1 Borehole Schedule

Cable Percussion Borehole & Rotary Core Locations								
Hole ID.	Type	Scheduled Depth (m BGL)				Remarks	Coordinates (ITM Grid)	
		CP	RO	PG	RC		Easting	Northing
Marine BHs								
BH/RC101	CP & RC	15	-	-	20 to 30 (5m into rock)	RC may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples.	TBC	TBC
BH/RC102	CP & RC	15	-	-	20 to 30 (5m into rock)	RC may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples.	TBC	TBC
BH/RC103	CP & RC	15	-	-	20 to 30 (5m into rock)	RC may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples.	TBC	TBC
BH/RC104	CP & RC	15	-	-	20 to 30 (5m into rock)	RC may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples.	TBC	TBC
BH/RC105	CP & RC	15	-	-	20 to 30 (5m into rock)	RC may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Environmental samples.	TBC	TBC
Land BHs								
BH/RC106	CP & RC	15	-	-	20 to 30 (5m into rock)	RC may continue beyond its scheduled depth up to the level where rock is found. SPTs as per specification. Piezometer to be installed. Contamination Samples.	TBC	TBC
Notes	Each borehole may take approximately 3 no. days to complete. In-river borehole drilling will be undertaken from a low draft/flat-bottomed jack up barge.							

Table 2.2 Grab Sample Schedule for Contamination Assessment

Contamination Assessment Grab Sample Locations					
Hole ID.	Type	Scheduled Depth (m BGL)	Remarks	Coordinates (ITM Grid)	
				Easting	Northing
GS101	GS	0.5	Sediment samples to be taken from the riverbed soils at shallow depths and locations as per specification	TBC	TBC
GS102	GS	0.5	Sediment samples to be taken from the riverbed soils at shallow depths and locations as per specification	TBC	TBC
GS103	GS	0.5	Sediment samples to be taken from the riverbed soils at shallow depths and locations as per specification	TBC	TBC
GS104	GS	0.5	Sediment samples to be taken from the riverbed soils at shallow depths and locations as per specification	TBC	TBC
GS105	GS	0.5	Sediment samples to be taken from the riverbed soils at shallow depths and locations as per specification	TBC	TBC

Table 2.3 Geophysical Surveys

Geophysical Survey Locations			
Method	**Remarks**	**Coordinates (ITM Grid)**	
		Easting	**Northing**
Multi-Beam Echo Sounder (MBES)	*To provide continuous water depth profile and bathymetric chart*	-	-
Side Scan Sonar (SSS)	*To map riverbed conditions and sediments and detect potential obstructions, debris, existing infrastructure, etc.*	-	-
Sub-Bottom Profiling (SBP)	*Investigate shallow geology and sub-bottom stratigraphy*	-	-

Notes

1. CP = Cable Percussion, GS = Grab Sediment Sample; MBES = Multi-Beam Echo Sounder; RO = Rotary Open Hole, RC = Rotary Core, PG = Polymer Gel Geobor-S Rotary Coring, SBP = Sub-Bottom Profiling; SSS = Side Scan Sonar.
2. Coordinates to Irish Transverse Mercator Grid (ITM) and reduced levels to Malin Head Datum required for all BH i.e. CP and RC.
3. Undisturbed sampling is required in cohesive soils.
4. A minimum total core recovery of 95% and a minimum rock quality designation of 40% is required when coring in rock. Where voids are encountered a standard penetration test shall be undertaken.
5. Standard penetration tests are to be carried out as per the Specification.

2.4.5 Timing and Duration

The programming of the GI works has not yet been determined although they are anticipated to be completed within three months of their commencement.

2.5 Receiving Natural Environment

2.5.1 General Description and Context

As described in Section 2.2 above, the environmental surveys and GI works will be undertaken within the Lower Slaney Estuary in Co. Wexford. The land use on the northern side of the estuary is primarily agricultural while the southern side of the estuary is primarily urban development. The Lower Slaney Estuary is situated within the Slaney River Valley SAC and Wexford Harbour and Slobs SPA.

2.5.2 Habitats

Estuaries (MW4) is the principal habitat type that exists within the footprint of the environmental surveys and GI works. Other aquatic habitats recorded in the vicinity of the environmental surveys and GI works include Mud shores (LS4), Lower salt marsh (CM1) and Reed and large sedge swamps (FS1). The wider aquatic landscape comprises Estuaries (MW4) with Lower Salt Marsh (CM1) habitat growing along the banks. Terrestrial habitats recorded beyond the southern estuary shoreline include Buildings and artificial surfaces (BL3), Amenity grassland (improved) (GA2), Scrub (WS1) and Recolonising bare ground (ED3) The wider terrestrial habitat comprises largely of agricultural grassland with scattered residential dwellings and woodland areas. The urban town centre of Wexford is located at least 3km southeast of the proposed environmental surveys and GI works. Habitats are classified in accordance with 'A Guide to Habitats in Ireland' (Fossitt, 2000).

2.5.3 Marine Mammals

A review of records of marine mammals within the zone of influence was undertaken (NBDC, 2026) (Table 2.4).

Table 2.4 Marine Mammals listed on Annex II of the Habitats Directive recorded within the Zone of Influence.

Common Name	Scientific name
Harbour Seal	*Phoca vitulina*
Grey Seal	*Halichoerus grypus*
Bottle-nosed Dolphin	*Tursiops truncatus*
Harbour Porpoise	*Phocoena phocoena*

Both Grey and Harbour Seal are widespread and abundant in Irish waters. It is considered likely that these species could occur within close proximity to the proposed works. The risk of bottle-nosed dolphin and porpoise occurring in the vicinity of the proposed works is much lower, but it is possible that these species could occur in the vicinity of the proposed works.

2.5.4 Otter

Otter is listed under Annex II and Annex IV of the EU Habitats Directive and are also protected under the Irish Wildlife Acts. This species is distributed throughout Ireland. Otter territories are typically between 2 – 32km in length but can be up to 80km (Kruuk, 1995). There are records of Otter in the Slaney Estuary adjacent to the environmental surveys and GI works according to data supplied by the NPWS (2025) and NBDC (2026).

Surveys for Otter were carried out on the 19th April 2024 and the 4th December 2025 for the proposed Irish National Heritage Park project. The survey was undertaken along the southern bank of the River Slaney, including the woodlands due to the potential for suitable habitat. A live Otter was recorded on the 4th December in the River Slaney, upstream of the proposed environmental survey locations. No other evidence of Otter (e.g. holts, spraints and couches) was recorded during either survey. Remains of crustaceans were recorded on the fishing pier adjacent to the Ferrycarrig Bridge on the 4th December 2025, although no evidence of Otter was recorded on this pier.

2.5.5 Birds

Monthly wintering bird surveys were conducted for the proposed Irish National Heritage Park from October 2020 – April 2021 and October 2023 – April 2024. The surveys were undertaken from six locations along the southern bank of the estuary and included the estuary upstream and downstream of Ferrycarrig Bridge. All wintering bird species were recorded using a 'look-see' approach (Bibby et al., 2012). A total of 26 No. wintering bird species were recorded during the wintering bird surveys.

Survey for winter roosts of Hen Harrier was undertaken from October to February 2026. This survey involved the surveyor carrying out a vantage point watch of the reed beds opposite the heritage park from two hours before sunset until dark.

2.5.6 Aquatic Environment

The environmental surveys and GI works are proposed to take place entirely within the Lower Slaney Estuary Transitional Waterbody, which extends as far north as Enniscorthy and ends in Wexford Harbour.

Numerous studies of the fish populations of the River Slaney provide detailed information on the species present within the catchment. Several fish species protected under Annex II of the Habitats Directive have been recorded in the Slaney catchment including Atlantic Salmon (*Salmo salar*), Twaite Shad (*Alosa fallax*) and lamprey (*Lampetra sp.*).

Water Quality

The Water Framework Directive (WFD) requires that each EU Member State protects and improves water quality in all waters so that good ecological status is achieved. Additionally, proposed actions (within discrete River Basin Management Plans) are also required, to secure national natural water resources for the future. The Environmental Protection Agency (EPA) is the competent authority responsible for monitoring, protecting and improving the water environment in the Republic of Ireland. In accordance with WFD guidelines, water quality 'Status' is assigned using a variety of available data on aquatic flora and fauna (including fish), the availability of nutrients, and aspects like salinity, temperature and pollution by chemical pollutants. Morphological features, such as quantity, water flow, water depths and structures of the riverbeds, are also taken into account. The current status for the waterbodies in proximity of the proposed works are presented in Table 2.4.

Table 2.4 EPA Water Quality Results

WFD Waterbody	Transitional Waterbody WFD Status 2019-2024	Transitional Waterbody WFD Status 2016-2021	Transitional Waterbody WFD Status 2016-2021	Waterbodies Risk
Lower Slaney Estuary Transitional Waterbody	Poor	Poor	Poor	At Risk

2.6 Assessment

The ecological baseline which was established by the desk studies and field surveys described above was used to inform the assessment of the potential ecological effects arising from the proposed works, particularly with regard to European sites. Any assumptions that were made in view of gaps in the ecological data were made in accordance with the Precautionary Principle.

2.6.1 Likely Effects on the Natural Environment

Underwater noise

Underwater noise emissions will come from the environmental surveys and GI works (e.g., acoustics from the ADCPs and geophysical surveys). Table 2.6 presents an overview of the underwater noise levels which are emitted by the environmental survey equipment and GI works at 1m from the source.

Marine mammals and migratory fish are vulnerable to anthropogenic noise inputs into the aquatic environment. Underwater noise has the potential to cause a range of impacts to marine life including to injury (hearing damage) and behavioural changes. Hearing damage injury is known as threshold shift can be either permanent (Permanent Threshold Shift, (PTS)) or temporary (Temporary Threshold Shift, (TTS)).

Behavioural changes can include communication disruption, altered foraging behaviour or displacement from the area. Noise from anthropogenic sources have been measured to assess the levels which could cause injury to marine mammals. These are used as thresholds and are commonly used to assess the level of risk associated with noise producing activities in the marine environment. The lowest threshold for TTS in cetaceans is 183 dB SEL and for pinnipeds it is 171dB SEL (Southall et al. 2007), these are presented below in Table 2.5.

Table 2.5 Marine mammal noise exposure criteria given by Southall et al. (2007).

Species	Hearing group and estimated auditory bandwidth (kHz)	Exposure Criteria (SPL – sound pressure level[11], SEL – sound exposure level[12])		
		PTS – onset	TTS-onset	Behavioural response
Harbour Porpoise (*Phocoena phocoena*)	High-frequency cetaceans 0.2 - 180 kHz	230 dB SPL 198 dB SEL	224 dB SPL 183 dB SEL	90-170 dB RL [13]
Common Bottlenose Dolphin (*Tursiops truncatus*)	Mid-frequency cetaceans 0.15 - 160 kHz	230 dB SPL 198 dB SEL	224 dB SPL 183 dB SEL	90-200 dB RL
Pinnipeds Harbour Seal (*Phoca vitulina)* Grey Seal (*Halichoerus grypus*)	Pinnipeds in water 0.075 - 75 kHz	218 dB SPL 203 dB SEL	212 dB SPL 171 dB SEL	100+ dB RL

Fish exhibit a high degree of variability in terms of sensitivity to sound impacts between different hearing-sensitive groups. Some research suggests that non-hearing specialist fish are 100-times less sensitive to sound than hearing specialists. A precautionary threshold of 186dB SEL has been adopted for this assessment based on information in Popper et al (2014).

[11] Sound Pressure Level (SPL) – A logarithmic measure in decibels (dB) of the average pressure level in water/air, with respect to a standard reference pressure (i.e., re. 1µPa in water or 20µPa in air). Commonly standardised to a distance of 1 metre from the source (i.e., @ 1m), SPL represents the amplitude of a sound's waveform and it may be measured in a number of ways including peak or peak-to-peak (for short duration sounds) and root mean square (i.e., rms) estimates (for continuous sounds).
[12] Sound Exposure Level (SEL) – A measure of sound energy over a given duration, i.e., time integral of instantaneous sound pressure squared, normalised to a 1 second period (dB re. µPa2–s or µPa2.s).
[13] Sound Received Level (RL) – the pressure level measured at the receiver, e.g., mammal.

Table 2.6 Underwater noise levels emitted by the environmental survey equipment.

Sound Type	SIL (dB ref µPa at 1 m)	Frequency (kHz)	Within marine mammal and fishes frequency hearing ranges
Environmental Surveys			
Acoustic Doppler Current Profiler (ADCP) (Model: Signature1000)	217	600-1000	No
Vessel (Sediment Sampling)	180	<1	Yes
GI Works			
Cable Percussion (CP)	220	<0.5	Yes
Rotary Core (RC)	170	0.5-5	Yes
Multi-Beam Echo Sounder (MBES)	210-245	200 - 500	No
Side Scan Sonar (SSS)	200 - 240	200 - 700	No
Sub-Bottom Profiling (SBP)	185 - 215	2 – 15	Yes
Vessel	180	<1	Yes

The ambient underwater noise levels in Wexford Harbour is not known but is expected to be dominated by environmental noise (e.g. tidal movement of water and sediment) and shipping traffic. Downstream of the proposed development in Wexford Harbour, noise due to recreational and fishing vessels transiting between Wexford town and the Irish Sea adds to the baseline underwater noise levels. Mussel fishing vessels are particularly common in Wexford Harbour with a large area of the harbour licenced under active Aquaculture licences.

Based on the sound frequencies that will be emitted during the ground investigation and environmental surveys, as listed in Table 2.6, and the hearing ranges of the marine mammals as listed in Table **2.5**, there is a potential impact to marine mammals as a result of the GI works.

Airborne noise

The environmental surveys and GI works provide a source of airborne noise, which has the potential to cause disturbance to terrestrial species such as otter and birds. Engines and generators operating can produce noise levels ranging from 80–120 dB(A) at the source. These noise sources would produce a regular source of sound above 70 dB(A) which may result in a 'moderate' response from birds (Cutts *et al.*, 2013). Regular or constant sources of noise result in lower disturbance responses from bird species regardless of noise level, e.g. a dropped piece of scaffold at 65 dB will cause a greater disturbance reaction than ongoing vibratory piling at 80 dB(A).

An engine (or similar) producing noise of 120dB(A) at the source would reduce to acceptable dose levels between 170m and 341m from the source (Cutts *et al.*, 2013). 70dB(A) is considered acceptable for birds. An 'acceptable dose level' of noise is that which would not result in any impact to birds or that which may occasionally induce a low-level behavioural response such as a heads-up. 120 dB(A) would reduce to 70 dB(A) at a distance of 316m. Therefore, noise disturbance to birds may occur within 316m of the proposed works.

However, given that the environmental surveys and GI works will take place in proximity to the existing N11 and the R730, there is a higher level of ambient noise due to the road traffic along and over the estuary and the area that would be impacted by noise is likely to be much less than 316m. Furthermore, birds utilising this area are also likely to have a level of habituation to sources of noise due to the close proximity of the existing roads and shipping traffic in Wexford Harbour downstream of the proposed works.

Disturbance/displacement

The presence of humans and vessels working in the Lower Slaney Estuary may cause visual disturbance to species (e.g. otter, bird species) in the water or on the mudflats exposed at low tide. Disturbance due to visual stimuli may occur up to 500m from the source for some highly sensitive species (Cutts *et al.*, 2013).

The sediment sampling surveys requires the removal of sediment from the riverbed. Aquatic species, such as fish, have the potential to be present in the vicinity of the sampling locations and would be disturbed/ displaced. However, this would be over a very small area and fish and marine mammals would have ample time to move outside the area where the sampling was taking place.

Habitat loss

The sediment surveys and grab sampling require removal of sediment from the riverbed. The locations of the sediment sampling sites are presented above in Figure 1.2. The nature and tidal state of the habitat at the location of the sampling sites is such that, with any movement or removal of the sediment will cause the immediate surrounding sediment to infill any area immediately and not provide for any loss of sediment habitat.

Water quality

Threats to watercourses and associated habitats potentially include the mobilisation of sediment within the estuary during the environmental surveys and GI works as well as the release of pollutants such as fuels and hydrocarbons from vessels associated with the proposed works. The environmental surveys and GI works are of a nature and scale that any water quality impacts would be very localised and will dissipate in a very short time. The risk of pollution to the aquatic environment from such sources outlined above, particularly into the Slaney Estuary, arising from the environmental surveys and GI works is minimal.

3. IDENTIFICATION OF ADVERSE EFFECTS

3.1 Establishing the Zone of Influence

Section 3.2.3 of DEHLG (2010) outlines the procedure for selecting the European sites to be considered in AA. It states that European sites potentially affected should be identified and listed, bearing in mind the potential for direct, indirect and cumulative effects. It also states that the specific approach in each case is likely to differ depending on the scale and likely effects of the plan or project. However, it advises that the following sites should generally be included:

- All European sites within or immediately adjacent to the plan or project area;
- All European sites within the zone of influence of the plan or project; and,
- In accordance with the Precautionary Principle, all European sites for which there is doubt as to whether or not they might be significantly affected.

The "zone of influence" of a project is the geographic extent over which significant ecological effects are likely to occur. In the case of projects, the guidance recognises that the zone of influence must be established on a case-by-case basis using the Source-Pathway-Receptor Model (OPR, 2021). A project may only lead to adverse effects on the integrity of the European site where all three elements of Source-Pathway-Receptor are linked. In the absence of one element of this model, adverse effects can be screened out with confidence. The assessment should make reference to the following key variables:

- The nature, size and location of the proposed works;
- The nature of the impacts which may arise from the proposed works;
- The sensitivities of the ecological receptors; and,
- The potential for in-combination effects.

For example, in the case of a project that could affect a watercourse, it may be necessary to include the entire upstream and/or downstream catchment in order to capture all European sites with water-dependent features of interest.

In the marine environment, a Zone of Influence can be extensive as pollution and materials can easily be transported elsewhere and currents and waves can be altered causing effects well beyond the site and effects on mobile species may be manifest elsewhere (CIEEM, 2018).

Having regard to the above key variables, a zone of influence was established for Qualifying Interest species and groups that have potential to occur within the vicinity of the proposed works. Only Qualifying Interests which are vulnerable to the types of impacts arising from the proposed works have been included. Habitats have not been included, as the nature and scale of the proposed works means that there will be no potential for adverse effects on habitats, as outlined in Section 2.6.1 in relation to habitat loss and water quality. Each zone of influence is presented in Table 3.1 below.

Table 3.1 Zone of Influence for QI species/ species groups

Receptor	Zone of Influence	Justification
Cetaceans	Management Unit	Cetaceans are highly mobile species, with populations ranging over very large areas. Therefore, the Management Unit (MU) as defined in Review of Management Unit boundaries for cetaceans in UK waters (JNCC, 2023) has been considered as the zone of influence for each species of cetacean. Harbour Porpoise and Bottlenose Dolphin are the only Annex II cetacean species in Europe.
	Harbour porpoise (*Phocoena phocoena*) Management Unit	The relevant management unit for Harbour Porpoise in the vicinity of the proposed works is the 'Celtic and Irish Seas Management Unit'. This area includes the coast of Ireland excluding the north coast from north Antrim to Donegal, the west and southwest coast of Britain (from the south of Scotland to Bournemouth), the northwest coast of France (approximately Brest to Cherbourg) and the seas within this area. This species could be impacted by underwater noise arising from the proposed works.
	Bottlenose dolphin (*Tursiops truncatus*) Management Unit	The relevant management unit for Bottlenose dolphin in the vicinity of the proposed works is the 'Irish Sea Management Unit'. This area includes the east coast of Ireland (between Antrim and Waterford) and the west coast of Britain (between the south of Scotland and Pembrokeshire, Wales). This species could be impacted by underwater noise arising from the proposed works.
Grey Seal (*Halichoerus grypus*)	448km	Grey Seals have a foraging range of up to 448km (Carter et al, 2022). This species could be impacted by underwater noise arising from the proposed works. Therefore, the zone of influence for Grey Seal is 448km. This area includes the coastal areas of Ireland from the proposed works south to Loop Head and north to Malin Head, and the west coast of Britain from Islay in Scotland to Plymouth on the south coast of England.
Harbour Seal (*Phoca vitulina*)	273km	Harbour Seal has a foraging range of up to 273km (Carter et al, 2022). This species could be impacted by underwater noise arising from the proposed works. Therefore, the zone of influence for Harbour Seal is 273km. This area includes the coastal areas of Ireland from the proposed works south to Cape Clear and north to Strangford Lough, and the west coast of Britain from Liverpool to Land's End.
Otter	80km	Otter typically have territories between 2km and 32km in length, however can be as far as 80km (Kruuk, 1995). Therefore, the zone of influence for otter is 80km. This species could be impacted by noise or visual disturbance arising from the proposed works.

Receptor	Zone of Influence	Justification
Twaite Shad	The south and east coasts of Ireland, between Carlingford Lough and Cape Clear.	Shad species have an affinity for coastal habitats (Maitland & Hatton-Ellis, 2003). However, the specific behaviour of Twaite Shad at sea is poorly understood. Acoustic tagging of Twaite Shad in the River Severn detected one tagged fish in the Munster Blackwater, 950km from where it had been tagged. Given this distance the low densities these fish would occur at, and the nature of the proposed works, the zone of influence for Shad is the south and east coasts of Ireland, between Carlingford Lough and Cape Clear. Given that this species is a hearing specialist species, it may be vulnerable to noise disturbance arising from the proposed works.
River Lamprey & Sea Lamprey	The south and east coasts of Ireland, between Carlingford Lough and Cape Clear.	As adults, river Lamprey spend most of their life cycle in coastal and estuarine habitats. Therefore, the zone of influence for River Lamprey is the south and east coasts of Ireland, between Carlingford Lough and Cape Clear. Sea lamprey is widely dispersed at sea and their movements are largely dictated by their host fish. Given the nature of the proposed works and the densities of Sea Lamprey at sea, the zone of influence for this species is restricted to the south and east coasts of Ireland, between Carlingford Lough and Cape Clear.
Atlantic Salmon	The River Barrow, the River Suir and the River Slaney.	Atlantic Salmon migrate between river and the open ocean. Irish Salmon migrate to the Northeast Atlantic. Migrating Salmon move directly between saltwater and freshwater environments and are generally not found in coastal water around Ireland (Rikardsen et al, 2021), therefore a zone of influence includes the watercourses in south-east Ireland, namely the River Barrow, River Suir and the River Slaney, and their connections to the open sea.
Non-breeding seabirds, wildfowl and waders	15km	Non-breeding seabirds, wildfowl and waders generally inhabit estuaries, migrating locally between feeding sites, roosts and between estuaries. The movements of wintering birds between these sites is likely to be between site that are close together (SNH, 2023). Considering this, European sites within 15km of the proposed works have been considered with regards to non-breeding seabirds, wildfowl and waders. These species could be impacted by noise or visual disturbance arising from the proposed works.

Receptor	Zone of Influence	Justification
Breeding Seabirds	The south and east coasts of Ireland, between Carlingford Lough and Cape Clear and the western coast of Britain, from Lands End to Anglesey Island.	The zone of influence for breeding seabirds is based on the mean-max foraging ranges of the 15 breeding seabirds in Ireland (Woodward et al., 2019). The mean-max is the maximum range reported for colonies of each species averaged across studies/colonies. Considering the densities of seabirds will decrease over distance, as well as the nature and scale of the proposed works, the zone of influence for breeding seabirds is the south and east coasts of Ireland, between Carlingford Lough and Cape Clear and the western coast of Britain, from Lands End to Anglesey Island is appropriate. Birds from European sites outside this area may occur in the area of the proposed works, however this would be restricted to small numbers of individuals. These species could be impacted by noise or visual disturbance arising from the proposed works.

European sites outside of the zones of influence identified above are excluded due to various factors such as lack of a pathway for impacts (considerable distance, lack of hydrological connection and/or lack of supporting habitat for qualifying interest species in the vicinity of the proposed works) or lack of source of impact (species not vulnerable to the types of impact that may be produced by the proposed works). There are no pathways for impacts arising from the proposed works to reach those sites, therefore there is no potential for adverse effects to occur to the qualifying interests of those European sites.

Mapping on QGIS 3.28.8 was used to identify sites within each respective zone of influence, using the boundary of the proposed works and publicly available Ordnance Survey Ireland maps. This was used in combination with NPWS shapefiles to identify the boundaries of European sites in Ireland, and the publicly available online GIS tools for the counties outside Ireland with the zone of influence. The sites within the zone of influence for each Qualifying Interest is presented below in Table 3.2. Given the large number of European Sites which occur within the zone of influence for each Qualifying Interest, descriptions of these sites have not been provided.

Table 3.2 European sites within the zones of influence for each Qualifying Interest species

European site [site code]	Country	Are there potential pathways for impacts from the proposed works to this site? Explain.
European sites within the 'Celtic and Irish Seas' Management Unit of and designated for Harbour Porpoise (JNCC, 2023)		
Rockabill to Dalkey SAC (IE003000)	Ireland	**Yes.** Individuals from European sites within the Celtic and Irish Seas Marine Mammal Management Unit could be present in the area of the proposed works.
Lambay Island SAC (Site Code IE000204)	Ireland	
Codling Fault Zone SAC (Site code IE003015)	Ireland	
Roaringwater Bay and Islands SAC [Site code IE000101]	Ireland	
Carnsore Point SAC [Site code IE002269]	Ireland	
Blackwater Bank SAC [Site code IE002953]	Ireland	
Kenmare River SAC [Site code IE002158]	Ireland	
Kilkieran Bay and Islands SAC [Site Code IE002111]	Ireland	
West Connact Coast SAC [Site Code IE002998]	Ireland	
Hook Head SAC [Site Code IE000764]	Ireland	
Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [Site Code IE000625]	Ireland	
Blasket Islands SAC [Site Code IE002172]	Ireland	
Inishmore Island SAC [Site code IE000213]	Ireland	
North Channel SAC [Site code UK0030399]	Northern Ireland	
North Anglesey Marine SAC [Site code UK0030398]	Wales	
Bristol Channel Approaches SAC [Site code UK003039]	Wales	
West Wales Marine SAC [Site Code UK0030397]	Wales	
Récifs et landes de la Hague SAC [Site code FR2500084]	France	
Anse de Vauville SAC [Site code FR2502019]	France	
Chausey SAC [Site code FR2500079]	France	

European site [site code]	Country	Are there potential pathways for impacts from the proposed works to this site? Explain.
Estuaire de la Rance SAC [Site code FR5300061]	France	
Cap d'Erquy-Cap Fréhel SAC [Site code FR5300011]	France	
Tregor Goëlo SAC [Site code FR5310070]	France	
Nord Bretagne DH SCI [Site code FR2502022	France	
Abers - Côte des légendes SCI [Site code FR5300017]	France	
Côtes de Crozon SAC [Site code FR5302006]	France	
Riviére Leguer, forêts de Beffou, Coat an Noz et Coat an Hay SAC [Site code FR5300008]	France	
Chaussée de Sein SAC [Site code FR5302007]	France	
Banc et récifs de Surtainville SAC [Site code FR2502018]	France	
Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SAC [Site code FR5300012]	France	
Baie de Saint-Brieuc - Est SAC [Site code FR5300066]	France	
Baie de Morlaix SAC [Site code FR5300015]	France	
Mers Celtiques – Talus du golfe de Gascogne SCI [Site code FR5302015]	France	
Baie du Mont Saint-Michel SAC [Site code FR2500077]	France	
Ouessant-Molène SAC [Site code FR5300018]	France	
European sites within the 'Irish Sea' Marine Mammal Management Unit of and designated for Bottlenose Dolphin (JNCC, 2023)		
Hook Head SAC [Site code IE000764]	Ireland	**Yes.** Individuals from European sites within the Irish Seas Marine Mammal Management Unit could be present in the area of the proposed works.
Lleyn Peninsula and the Sarnau SAC [Site code UK0013117]	Wales	
Cardigan Bay/ Bae Ceredigion SAC [UK0012712]	Wales	

European site [site code]	Country	Are there potential pathways for impacts from the proposed works to this site? Explain.
European sites within the Zone of Influence of and designated for Grey Seal.		
Saltee Islands SAC [000707]	Ireland	**Yes.** The proposed works are within the foraging range of Grey Seals from these SACs.
Lambay Island SAC [000204]	Ireland	
Roaringwater Bay and Islands SAC [000101]	Ireland	
Lundy SAC [UK0013114]	England	
Isles of Scilly Complex SAC [UK0013694]	England	
Pembrokeshire Marine/ Sir Benfro Forol [UK0013116]	Wales	
Pen Llŷn a'r Sarnau / Lleyn Peninsula and the Sarnau SAC [UK0013117]	Wales	
European sites within the Zone of Influence of and designated for Harbour Seal.		
Strangford Lough SAC [UK0016618]	Ireland	**Yes.** The proposed works are within the foraging range of Harbour Seals from this SAC.
Murlough SAC [UK0016612]	Ireland	
Lambay Island SAC [000204]	Ireland	
Slaney River Valley SAC [000781]	Ireland	
Glengariff Harbour and Woods SAC [00090]	Ireland	
Kenmare River SAC [002158]	Ireland	
European sites within the Zone of Influence of and designated for Otter.		
River Barrow and River Nore SAC [Site code IE002162]	Ireland	**Yes.** The proposed works are within the potential home range of Otter from these SACs.
Slaney River Valley SAC [000781]	Ireland	
European sites within the Zone of Influence of and designated for Twaite Shad.		
Slaney River Valley SAC [000781]	Ireland	**Yes**. For part of its life cycle, Twaite Shad inhabits coastal waters and is vulnerable to underwater noise.
River Barrow and River Nore SAC [002162]	Ireland	
Lower River Suir SAC [002137]	Ireland	
Blackwater River (Cork/Waterford) SAC [002170]	Ireland	
European sites within the Zone of Influence of and designated for River Lamprey		
Slaney River Valley SAC [000781]	Ireland	**Yes**. For part of its life cycle, River Lamprey inhabits coastal waters and is vulnerable to underwater noise.
River Barrow and River Nore SAC [002162]	Ireland	

European site [site code]	Country	Are there potential pathways for impacts from the proposed works to this site? Explain.
Lower River Suir SAC [002137]	Ireland	
Blackwater River (Cork/Waterford) SAC [002170]	Ireland	
River Boyne and River Blackwater SAC [002299]	Ireland	
Blackwater River (Cork/Waterford) SAC [002170]	Ireland	
European sites within the Zone of Influence of and designated for Sea Lamprey.		
Slaney River Valley SAC [000781]	Ireland	**Yes**. For part of its life cycle, Sea Lamprey inhabits coastal waters and is vulnerable to underwater noise.
River Barrow and River Nore SAC [002162]	Ireland	
Lower River Suir SAC [002137]	Ireland	
Blackwater River (Cork/Waterford) SAC [002170]	Ireland	
Blackwater River (Cork/Waterford) SAC [002170]	Ireland	
European sites within the Zone of Influence of and designated for Atlantic Salmon		
Slaney River Valley SAC [000781]	Ireland	**Yes.** Salmon pass through the work area on their inward and outward migration and are vulnerable to underwater noise.
River Barrow and River Nore SAC [002162]	Ireland	**No.** The inward and outward migrations of Salmon are direct, therefore, no pathways for impacts between the proposed works and this European site exist
Lower River Suir SAC [002137]	Ireland	**No.** The inward and outward migrations of Salmon are direct (inset ref), therefore, no pathways for impacts between the proposed works and this European site exist
European sites within the Zone of Influence of and designated for non-breeding birds.		
Wexford Harbour and Slobs SPA [IE004076]	Ireland	**Yes.** The proposed works are within this European site.
Seas off Wexford SPA [IE004237]	Ireland	Yes. The shortest distance from the proposed works to the site is 10km.
The Raven SPA [IE004019]	Ireland	**Yes.** The shortest distance from the proposed works to the site is 10km.
European sites within the Zone of Influence of and designated for Breeding Seabirds.		
Wexford Harbour and Slobs SPA [IE004076]	Ireland	**Yes.** The proposed works are within this European site.
Dalkey Island SPA [IE004172]	Ireland	**No.** This site is 105km north of the proposed works. This is a greater than the mean-max foraging ranges of the Qualifying Interests. Therefore, no pathways for effects between the proposed works and this European site exist.

European site [site code]	Country	Are there potential pathways for impacts from the proposed works to this site? Explain.
Howth Head Coast SPA [IE004113]	Ireland	**Yes**. This site is 116km north of the proposed works and within the mean-max foraging range of Kittiwake, which is the only Qualifying Interest of this site.
Ireland's Eye SPA [IE004117]	Ireland	**Yes**. This site is 120km north of the proposed works and within the mean-max foraging range of one of the Qualifying Interests, Kittiwake.
Lambay Island SPA [004069]	Ireland	**Yes**. This site is 135km north of the proposed works and within the mean-max foraging range of Kittiwake, Fulmar and Puffin.
South Dublin Bay and River Tolka Estuary SPA [004024]	Ireland	**No.** This site is 105km north of the proposed works. This is a greater than the mean-max foraging ranges of the Qualifying Interests. Therefore, no pathways for effects between the proposed works and this European site exist.
North West Irish Sea [IE004236]	Ireland	**Yes.** This site is 115km north of the proposed works and within the mean-max foraging range for the following Qualifying Interests: Fulmar, Manx Shearwater, Lesser Black-backed Gull, Kittiwake and Puffin.
Anglesey Terns / Morwenoliaid Ynys Môn SPA [UK9013061]	UK	**No.** This site is 165km east of the proposed works. This is a greater than the mean-max foraging ranges of the Qualifying Interests. Therefore, no pathways for effects between the proposed works and this European site exist.
Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA [UK9013121]	UK	**No.** This site is 170km east of the proposed works. This is a greater than the mean-max foraging ranges of the Qualifying Interests. Therefore, no pathways for effects between the proposed works and this European site exist.
Northern Cardigan Bay / Gogledd Bae Ceredigion SPA [UK9020327]	UK	**No.** This site is 170km east of the proposed works. This is a greater than the mean-max foraging ranges of the Qualifying Interests. Therefore, no pathways for effects between the proposed works and this European site exist.
Grassholm SPA [UK9014041]	UK	**Yes.** This site is 125km east of the proposed works and within the mean-max foraging range of the Qualifying Interest, Gannet.
Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA [UK9014051]	UK	**Yes.** This site is 125km from the proposed works and within the mean-max foraging range of Max Shearwater, Storm Petrel, Lesser Black-backed Gull and Puffin.
Isles of Scilly SPA [UK9020288]	UK	**Yes.** This site is 240km from the proposed works and within the mean-max foraging range of Storm Petrel.

3.2 Evaluation against Conservation Objectives

Table 3.3 to Table 3.9 below detail the evaluation of the potential for adverse effects of the proposed works, in view of the Conservation Objectives of the sites identified in Section 3.1. As explained in Sections 1.3 and 1.4, AA is carried out in view of the Conservation Objectives of the relevant European sites, which are in turn defined by detailed Attributes and corresponding Targets. Therefore, the evaluation of whether or not an impact could have the potential to result in adverse effects (in view of the Conservation Objective in question) is made with regard to these Attributes and Targets.

The Conservation Objectives and associated Attributes and Targets for each respective Qualifying Interest species are the same for all sites in which the Qualifying Interest is designated, therefore the evaluation has been carried out in view of the type of impact which could result in an adverse effect. The evaluation thus applies for all sites within the zone of influence for which the Qualifying Interest is designated. To carry out the evaluation for each individual site would lead to undue repetition.

Table 3.3 Evaluation of the likely effects of underwater noise disturbance from the proposed works in view of the Conservation Objectives of the sites where marine mammals are a qualifying interest

Qualifying Interest	Conservation Objective	Does the proposed works provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Harbour Porpoise (*Phocoena phocoena*)	To maintain (or restore) the favourable conservation condition of Harbour Porpoise in the sites in which it is designated.	Underwater noise has the potential to cause a range of impacts to marine life including to injury (hearing damage) and behavioural changes. Hearing damage injury to marine mammals is known as threshold shift can be either permanent (permanent threshold shift, PTS) or temporary (temporary threshold shift, TTS). Behavioural changes can include communication disruption, altered foraging behaviour or displacement from the area. Noise from anthropogenic sources have been measured to assess the levels which could cause injury to marine mammals. These are used as thresholds and are commonly used to assess the level of risk associated with noise producing activities in the marine environment. The lowest threshold for TTS in cetaceans is 196 dB and for pinnipeds it is 181 dB for non-pulsed sound. The sub-bottom profiler and cable percussion piling are the only elements of the proposed works that will emit sound at frequencies audible to marine mammals and at sound levels that exceed their TTS limits. **Therefore, adverse effects on the Conservation Objectives for these Qualifying Interest species resulting from the proposed works cannot be ruled out at this stage.**	**Yes**
Common Bottlenose Dolphin (*Tursiops truncatus*)	To maintain (or restore) the favourable conservation condition Bottlenose Dolphin in the sites in which it is designated.		**Yes**
Harbour Seal (*Phoca vitulina)*	To maintain (or restore) the favourable conservation condition of Harbour Seal in the sites in which it is designated.		**Yes**
Grey Seal (*Halichoerus grypus*)	To maintain (or restore) the favourable conservation condition of Grey Seal in the sites in which it is designated.		**Yes**

Table 3.4 Evaluation of the likely effects of airborne noise and visual disturbance from the proposed works in view of the Conservation Objectives of the sites where Otter is a qualifying interest

Qualifying Interest	Conservation Objective	Does the proposed works provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Otter	To maintain (or restore) the favourable conservation condition of Otter in the sites in which it is designated.	Otter have been recorded in the immediate vicinity of the proposed surveys as well as Lower Slaney Estuary and Wexford Harbour (NBDC, 2025). A survey of the south bank of the River Slaney in the vicinity of the proposed surveys was undertaken in April 2024 and December 2025. Otter were seen occasionally during wintering bird surveys undertaken over the preceding years. Otter are likely to be in the River Slaney during the proposed works. Temporary disturbance could occur if sampling is carried out near an active otter holt. However, the presence of the heritage park, the N11 and occasional boat traffic in the area means that otter in the will be habituated to the presence of vessels and people. The proposed works will occur in a small area for a brief period of time and the noise levels are below the level that could cause injury to Otter. Given these findings, there will be no disturbance impacts or acoustic-related injuries to otters as a result of the environmental surveys. There is also a potential risk of suspending contaminants from the sediment during sampling which could lead to heavy metals or other contaminants entering the food chain. However, given the small volume of sediment involved and given the dilution capacity of the Slaney Estuary, this risk is negligible. **Therefore, it can be concluded beyond reasonable scientific doubt that the project will not significantly affect the European sites listed in Table 3.2 in view of the Conservation Objectives for Otter.**	**No**

Table 3.5 Evaluation of the likely effects of underwater noise disturbance from the proposed works in view of the Conservation Objectives of the sites where Twaite Shad is a Qualifying Interest.

Qualifying Interest	Conservation Objective	Does the proposed works provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Twaite Shad	To maintain (or restore) the favourable conservation condition of Twaite Shad in the sites in which it is designated.	Twaite shad are found in coastal waters, and spawn close to the upper tidal limit, which is close to Enniscorthy c. 20km upstream. This species is a hearing specialist species, and is vulnerable to noise disturbance arising from the proposed works. The sound emittance from the cable percussive boring and the sub-bottom profiler are within the hearing range of Twaite Shad and will emit noise at levels that could cause injury. There is a risk of suspending contaminants from the sediment during sampling which could lead to heavy metals or other contaminants entering the water column, which may deteriorate the surrounding habitat. However, given the small volume of sediment (5 litres per site) and the shallow grab (15 cm), and given the dilution capacity of the Slaney Estuary, this risk is negligible. **Therefore, adverse effects on the Conservation Objectives for Twaite Shad resulting from the proposed works cannot be ruled out at this stage.**	**Yes**

Table 3.6 Evaluation of the likely effects of underwater noise disturbance from the proposed works in view of the Conservation Objectives of the sites where River Lamprey and Sea Lamprey are a Qualifying Interest.

Qualifying Interest	Conservation Objective	Does the proposed works provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
River Lamprey and Sea Lamprey	To restore the favourable conservation condition of River Lamprey and Sea Lamprey in the Slaney River Valley SAC.	The Attributes of these Conservation Objectives focus on "*Distribution*", "*Population structure of juveniles", "Juvenile density in fine sediment", "Extent and distribution of spawning habitat"* and *"Availability of juvenile habitat".* The sound emittance from the cable percussive boring and the sub-bottom profiler are within the hearing range of lamprey species and will emit noise at levels that could cause injury. There is a risk of suspending contaminants from the sediment during sampling which could lead to heavy metals or other contaminants entering the water column, which may deteriorate the surrounding habitat. However, given the small volume of sediment (5 litres per site) and the shallow grab (15 cm), and given the dilution capacity of the Slaney Estuary, this risk is negligible. **Therefore, adverse effects on the Conservation Objectives for these Qualifying Interest species resulting from the proposed works cannot be ruled out at this stage.**	**Yes**

Table 3.7 Evaluation of the likely effects of underwater noise disturbance from the proposed works in view of the Conservation Objectives of the sites where Atlantic Salmon is a Qualifying Interest.

Qualifying Interest	Conservation Objective	Does the proposed works provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Atlantic Salmon	To restore the favourable conservation condition of Atlantic Salmon in the Slaney River Valley SAC.	The Attributes of this Conservation Objective focuses on "*Distribution: extent of anadromy*", *"Adult spawning fish number", "Salmon fry abundance", "Out-migrating smolt abundance", "Number and distribution of redds"* and *"Water quality".* The sound emittance from the cable percussive boring and the sub-bottom profiler are within the hearing range of Atlantic Salmon and will emit noise at levels that could cause injury. There is a risk of suspending contaminants from the sediment during sampling which could lead to heavy metals or other contaminants entering the water column, which may deteriorate the surrounding habitat. However, given the small volume of sediment (5 litres per site) and the shallow grab (15 cm), and given the dilution capacity of the Slaney Estuary, this risk is negligible. **Therefore, adverse effects on the Conservation Objectives for Atlantic Salmon resulting from the proposed works cannot be ruled out at this stage.**	**Yes**

Table 3.8 Evaluation of the likely effects of airborne noise and visual disturbance from the proposed works in view of the Conservation Objectives of the sites where non-breeding wader, waterfowl, seabirds and Hen Harrier are a Qualifying Interest.

Qualifying Interest	Conservation Objective	Does the proposed works provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Non-breeding Seabirds Including: Light-bellied Brent Goose Shelduck Ringed Plover Golden Plover Grey Plover Bar-tailed Godwit Great Crested Grebe Pintail Goldeneye Red-breasted Merganser Oystercatcher Knot Dunlin Black-tailed Godwit Redshank Teal Shoveler Sanderling Curlew Turnstone	To maintain or restore the favourable conservation condition of non-breeding seabird species in the sites in which these species are designated.	Considering that the environmental surveys and GI works will take place over a short period of time and in proximity to the existing N11 and the R730, there is a higher level of ambient noise and visual cues due to the road traffic along and over the estuary and the area that would be impacted by noise will be within a small around the vessels required for the proposed works. Furthermore, any birds utilising this area are also likely to have a level of habituation to sources of noise due to the close proximity of the existing roads, the heritage park and shipping traffic downstream in Wexford Harbour. There is a risk of suspended contaminants from the sediment during sampling which could mobilise heavy metals or other contaminants which could affect habitat used by these species. However, given the small volume of sediment involved, and given the dilution capacity of the Slaney Estuary, this risk is negligible. **Therefore, it can be concluded beyond reasonable scientific doubt that the project will not significantly affect this European site in view of its Conservation Objectives for these Qualifying Interests.**	**No**

Qualifying Interest	Conservation Objective	Does the proposed works provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Great Northern Diver Little Gull Hen Harrier Wetland and Waterbirds [A999]			

Table 3.9 Evaluation of the likely effects of airborne noise and visual disturbance from the proposed works in view of the Conservation Objectives of the sites where breeding seabirds are a qualifying interest

Qualifying Interest	Conservation Objective	Does the proposed works provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
Breeding Seabirds Little Tern Lesser Black-backed Gull Puffin Manx Shearwater Kittiwake Fulmar Storm Petrel Gannet	To maintain (or restore) the favourable conservation condition of breeding seabirds in the sites in which these species are designated.	**Little Tern** Little Tern nest on the shingle islands and beaches around Wexford Harbour. The mean-max foraging range for Little Tern is 5km. The habitats in which Little Terns nest are dynamic and vary year to year. It is possible, although highly unlikely that Little Tern colonies could be within 5km of the proposed works. Given that this species primarily forages in deep coastal waters close to breeding colonies, the area surrounding the proposed works does not provide optimal foraging habitat. Therefore, the proposed works do not have the potential to cause noise disturbance to foraging Little Tern. Therefore, it can be concluded that noise and visual disturbance is unlikely to occur, or any such impacts will be limited to very few individuals and will not interfere with the achievement of the Conservation Objectives for these Qualifying Interests tern species. **Lesser Black-backed Gull** Lesser Black-backed Gull commonly breeds in urban environments (Keogh & Lauder (2021), often nesting on rooftops. No nests will be impacted by the proposed works and the individuals that may be present during the works would have a high level of habituation to human activity and noise. Therefore, the works will not result in disturbance to breeding Lesser Black-backed Gull. The breeding populations of the SPAs designated for Lesser Black-backed Gull are over 100km away from the proposed works. Given that these birds will preferentially forage in the waters surrounding the nesting colonies, the area surrounding the proposed works does not provide optimal foraging habitat, and very few individuals, if any, from breeding colonies would realistically occur within close proximity to the works. Therefore, the proposed works do not have the potential to cause noise disturbance resulting in adverse effects to foraging Lesser Black-backed Gull. **<u>Other Breeding seabirds</u>** **Puffin, Manx Shearwater, Kittiwake, Fulmar, Storm Petrel, Gannet.** These species breed on islands off the coast of Ireland and forage in deep waters along the east coast during summer. Therefore, there is no potential for these species to occur within the vicinity of the proposed works and thus there is no potential for the proposed works to cause noise or visual disturbance that would cause impacts to these species.	**No**

Qualifying Interest	Conservation Objective	Does the proposed works provide for any potential delay or interruption in the achievement of this Conservation Objective, as defined by its Attributes and Targets?	Adverse Effect
		Therefore, it can be concluded beyond reasonable scientific doubt that the project will not significantly affect this European site in view of its Conservation Objectives for these Qualifying Interests.	

3.3 Summary of Adverse Effects

In Section 3.1, it was established that European sites designated for the following Qualifying Interest species; Harbour Porpoise, Bottlenose Dolphin, Grey Seal Harbour Seal, Otter, Twaite Shad, Sea Lamprey, River Lamprey, Atlantic Salmon, non-breeding seabirds, waterfowl and waders, and breeding seabirds occur in the zone of influence of the proposed works and that there are no pathways for effects between the proposed works and any other European sites. These European sites are listed in Table 3.2.

In Section 3.3, it was established that, in the absence of appropriate mitigation, interruptions or delays in achieving Conservation Objectives for those sites with Harbour Porpoise, Bottlenose Dolphin, Grey Seal, Harbour Seal Twaite Shad, Sea Lamprey, River Lamprey, and Atlantic Salmon i.e., adverse effects on the integrity of those sites, as a result of the proposed works, cannot be ruled out. The number of European sites for each qualifying interest where potential adverse effects were identified is presented in 3.10 below.

Table 3.10 Summary of the European sites and their Qualifying Interests for which, in view of their Conservation Objectives, adverse effects cannot be ruled out at this stage.

No. European sites	Qualifying Interest
35	Harbour Porpoise (*Phocoena Phocoena*) [1351]
2	Bottlenose Dolphin (*Tursiops truncatus*) [1349]
7	Grey Seal (*Haliochoerus grypus*) [1364]
6	Harbour Seal (*Phoca vitulina*) [1365]
4	Twaite Shad (*Alosa fallax fallax*) [1103]
6	River Lamprey (*Lampetra fluviatilis*) [1099]
5	Sea Lamprey (*Petromyzon marinus*) [1095]
1	Atlantic Salmon (*Salmo salar*) [1106]

4. ASSESSMENT OF ADVERSE EFFECTS

4.1 Attributes and Targets

In Section 3 of this NIS, adverse effects of the proposed works on the integrity of a number of European Sites designated for the Qualifying Interests; Harbour Porpoise, Bottlenose Dolphin, Harbour Seal, Grey Seal, Twaite Shad, River Lamprey, Sea Lamprey and Atlantic Salmon were identified. In accordance with EC (2021), the identification of these effects was focused on and limited to the Conservation Objectives of the sites concerned.

Section 4 provides a detailed analysis and evaluation of the adverse effects identified in Section 3 (as summarised in Section 3.4). In order to fully assess the implications of the proposed works for the European sites concerned, each of the adverse effects are evaluated with reference to the Attributes and Targets which define the Conservation Objectives of those sites.

Evaluation of adverse effects is presented below for the source and type of impact, and then for receptor and as, in this case, the affected receptors have been identified as being affected the same set of impacts, to evaluate the same impacts under the headings of the relevant receptors would lead to undue repetition. Therefore, the evaluation of impacts is carried out under the headings of the type of impact.

4.2 Underwater noise disturbance

Underwater noise arising from the proposed works could result adverse effects to the following QI species Harbour Porpoise, Common Bottlenose Dolphin, Harbour Seal, Grey Seal, Twaite Shad, River Lamprey, Sea Lamprey and Atlantic Salmon.

Underwater noise has the potential to cause a range of impacts to marine mammals and migratory fish including injury (hearing damage) and behavioural changes. The noise emitted from the proposed works has been compared thresholds that are commonly used to assess the level of risk associated with noise producing activities in the marine environment. These thresholds are presented below in Table 4.1 for each species.

Table 4.1 Marine mammal and migratory fish noise exposure criteria.

Species	Hearing group and estimated auditory bandwidth (kHz)	Exposure Criteria (SPL – sound pressure level[14], SEL – sound exposure level[15])			Could cable percussive GI (assumed at SPL 220 dB re 1 µPa) have an effect?	Could the sub-bottom profiler (assumed at SPL 215 dB re 1 µPa) have an effect?
		PTS – onset *	TTS-onset	Behavioural response		
Harbour Porpoise (*Phocoena phocoena*)	High-frequency cetaceans 0.2 - 180 kHz	230 dB SPL 198 dB SEL	224 dB SPL 183 dB SEL	90-170 dB RL [16]	No potential for PTS or TTS. Yes - potential for behavioural response.	No potential for PTS or TTS. Yes - potential for behavioural response.
Common Bottlenose Dolphin (*Tursiops truncatus*)	Mid-frequency cetaceans 0.15 - 160 kHz	230 dB SPL 198 dB SEL	224 dB SPL 183 dB SEL	90-200 dB RL	No potential for PTS or TTS. Yes - potential for behavioural response.	No potential for PTS or TTS. Yes - potential for behavioural response.
Pinnipeds Harbour Seal (*Phoca vitulina)* Grey Seal (*Halichoerus grypus*)	Pinnipeds in water 0.075 - 75 kHz	218 dB SPL 203 dB SEL	212 dB SPL 171 dB SEL	100+ dB RL	Yes – potential for PTS, TTS and behavioural response.	Yes – potential for PTS, TTS and behavioural response at source.
Migratory Fish Twaite Shad River Lamprey Sea Lamprey Atlantic Salmon	0.1-5 kHz	205 dB SPL 183 dB SEL	205 dB SPL 183 dB SEL	205 dB SPL 183 dB SEL	Yes – potential for PTS, TTS and behavioural response.	Yes – potential for PTS, TTS and behavioural response.

*This table uses the lowest estimate for impacts across single-pulse and non-pulse noise sources

[14] Sound Pressure Level (SPL) – A logarithmic measure in decibels (dB) of the average pressure level in water/air, with respect to a standard reference pressure (i.e., re. 1µPa in water or 20µPa in air). Commonly standardised to a distance of 1 metre from the source (i.e., @ 1m), SPL represents the amplitude of a sound's waveform and it may be measured in a number of ways including peak or peak-to-peak (for short duration sounds) and root mean square (i.e., rms) estimates (for continuous sounds).
[15] Sound Exposure Level (SEL) – A measure of sound energy over a given duration, i.e., time integral of instantaneous sound pressure squared, normalised to a 1 second period (dB re. µPa2–s or µPa2.s).
[16] Sound Received Level (RL) – the pressure level measured at the receiver, e.g., mammal.

Potential for noise sources of the proposed works to impact on marine mammals and migratory fishes

Based on Table 4.1, cable percussive GI and the sub bottom profiler surveys have the potential to result in impacts on marine mammals and migratory fishes. The rate at which sound attenuates in water is dependent on a number of variables, including the nature of the substrate and ambient noise levels. Based on information from studies in Dublin Bay and the Port of Waterford, the ambient noise level in the River Slaney was estimated as c. 125 dB. Following this, the attenuation coefficient (*F*) was calculated as 15 (equivalent to a reduction of c. 4.5 dB per doubling in distance).

For seals, the TTS threshold is 212dB SPL. With the source of CP boring and the sub-bottom profiler generating 220dB SPL and 215Db SPL respectively, this means that the source of the noise would dip below the TTS threshold within 4m from the source for the CP boring and <2m for the Sub bottom profiler. Therefore, the potential for TTS and PTS impacts on seals is within 4m of the CP rig and <2m for the SBP survey equipment.

For migratory fish, the TTS threshold is 205dB SPL. Based on the CP boring and the sub-bottom profiler generating 220dB SPL and 215Db SPL respectively, this means that the source of the noise would dip below the TTS threshold within 10m from the source for the CP boring and <2m for the Sub bottom profiler. Therefore, the potential for TTS and PTS impacts on seals is within 4m of the CP rig and 6m for the SBP survey equipment.

Five no. CP boreholes will be undertaken and will take three days each to complete. The SBP survey will be carried out over several days and less than one week.

Seals are highly mobile and utilise large areas for feeding and at different stages of their life-cycles. The closest resting, breeding and moulting sites for seals are in Wexford Harbour, beyond the limit of any noise source.

The sub-bottom profiler emits sound directed at the sea floor or target structures and records reflected sound waves. The sound is highly directional, usually directed vertically downwards and has minimal dispersion of noise in non-target directions. Therefore, seals and fish would only be exposed to peak SPL from this source if they were to swim underneath the profiler. Given this survey will be completed within a number of days (less than one week), the chances of seals or fish to be exposed to this noise that could lead to TTS or behavioural change is unlikely. However, applying the precautionary principle, as there is a possibility that seals and could occur underneath the sub-bottom profiler, and that noise within this range could result in PTS, TTS or behavioural change.

The cable percussive boring will take place in five different locations in the River Slaney. The noise emitted from the CP rig could lead to PTS, TTS and behavioural changes in seals and fish. The noise from the CP rig will attenuate rapidly to below TTS levels, therefore the chances of seals or fish to be exposed to this noise that could lead to PTS. TTS or behavioural change is unlikely. However, applying the precautionary principle, as there is a possibility that seals and could occur close to the CP rig, and that noise within this range could result in TTS or behavioural change.

The evaluation of adverse effects of underwater noise disturbance must be made with reference to the specific conservation objectives of the SACs for which the species are designated. This evaluation is presented below in Table 4.2.

Table 4.2 Evaluation of potential of the proposed works to result in adverse effects to marine mammals, Twaite Shad and Atlantic Salmon.

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
Harbour Porpoise				
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use	• This target may be considered relevant to proposed activities or operations that will result in the permanent exclusion of harbour porpoise from part of its range within the site, or will permanently prevent access for the species to suitable habitat therein. • It does not refer to short-term or temporary restriction of access or range. • Early consultation or scoping with the Department in advance of formal application is advisable for proposals that are likely to result in permanent exclusion.	This attribute relates specifically to *permanent* exclusion of access to suitable habitat. The proposed works are temporary in nature and will be carried out over a period of less than 3 months. Therefore, proposed works do not have the potential to cause permanent (or temporary) exclusion of Harbour Porpoise from part of its range, or to prevent access to suitable habitat within their range. **There is no potential for adverse effects.**
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site	• Proposed activities or operations should not introduce man-made energy (e.g. aerial or underwater noise, light or thermal energy) at levels that could result in a significant negative impact on individuals and/or the community of harbour porpoise within the site. This refers to the aquatic habitats used by the species in addition to important natural behaviours during the species annual cycle.	The closest designated sites for Harbour Porpoise are 20km east of the proposed works, therefore there is no potential for underwater noise from the proposed works to impact this species within the site, as sound would attenuate to below the thresholds to cause a behavioural response in this species, therefore there is no potential to in-situ impacts to Harbour Porpoise within any European site. However, the proposed works may produce underwater noise that would be in excess of thresholds to cause a behavioural shift to Harbour Porpoise. However, in practice this is considered

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
			• This target also relates to proposed activities or operations that may result in the deterioration of key resources (e.g. water quality, feeding, etc) upon which harbour porpoises depend. In the absence of complete knowledge on the species ecological requirements in this site, such considerations should be assessed where appropriate on a case-by-case basis. • Proposed activities or operations should not cause death or injury to individuals to an extent that may ultimately affect the harbour porpoise community at the site.	highly unlikely due to the low likelihood that Harbour Porpoise would be present in the area of the proposed works and given that the noise produced by the works would rapidly attenuate to the ambient noise levels. The sub-bottom profiler also has the potential to exceed the behavioural response threshold level, were a Harbour Porpoise to swim underneath the vessel. Therefore, applying the precautionary principle, adverse effects cannot be excluded.
Common Bottlenose Dolphin				
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site us	• This target may be considered relevant to proposed activities or operations that will result in the permanent exclusion of bottlenose dolphin from part of its range within the site, or will permanently prevent access for the species to suitable habitat therein. • It does not refer to short-term or temporary restriction of access or range.	This attribute relates specifically to *permanent* exclusion of access to suitable habitat. The proposed works are temporary in nature and will be carried out over a period of less than 3 months. Therefore, proposed works do not have the potential to cause permanent (or temporary) exclusion of Bottlenose Dolphin from part of its range, or to prevent access to suitable habitat within their range. **There is no potential for adverse effects.**

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
			• Early consultation or scoping with the Department in advance of formal application is advisable for proposals that are likely to result in permanent exclusion.	
Habitat use: critical areas	Location and hectares	Critical areas, representing habitat used preferentially by bottlenose dolphin, should be maintained in a natural condition	• This target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) aquatic habitat used preferentially by bottlenose dolphin during the annual cycle and (b) the natural behaviour of bottlenose dolphin within such critical areas (i.e., preferred habitat). • Operations or activities that cause displacement of individuals from a critical area (i.e. preferred habitat) or alteration of natural behaviour to an extent that may ultimately interfere with key ecological functions would be regarded as significant and should therefore be avoided.	The proposed activities are not located in aquatic habitat that could be considered preferred habitat / critical habitat for Bottlenose Dolphin, which generally inhabits shallow coastal waters and on the continental shelf and slope waters up to 2000m deep. **There is no potential for adverse effects.**
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site	• Proposed activities or operations should not introduce man-made energy (e.g. aerial or underwater noise, light or thermal energy) at levels that could result in a significant negative impact on individuals and/or the population of bottlenose dolphin within the site.	The closest designated site for Bottlenose Dolphin is 60km south west of the proposed works. Therefore, there is no potential for underwater noise from the proposed works to impact this species within the site, as sound would attenuate to below the thresholds to cause a behavioural response in this species, therefore there is no potential to in-situ impacts to Bottlenose Dolphin within any European site.

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
			• This refers to the aquatic habitats used by the species in addition to important natural behaviours during the species' annual cycle. • This target also relates to proposed activities or operations that may result in the deterioration of key resources (e.g. water quality, feeding, etc) upon which bottlenose dolphins depend. In the absence of complete knowledge on the species' ecological requirements in this site, such considerations should be assessed where appropriate on a case-by-case basis. • Proposed activities or operations should not cause death or injury to individuals to an extent that may ultimately affect the bottlenose dolphin population at the site.	However, the proposed works will produce underwater noise that would be in excess of thresholds to cause a behavioural shift to Bottlenose Dolphin. However, in practice this is considered highly unlikely due to the low likelihood that Harbour Porpoise would be present in the area of the proposed works and given that the noise produced by the works would rapidly attenuate to the ambient noise levels. Therefore, applying the precautionary principle, adverse effects cannot be excluded.
Harbour Seal and Grey Seal				
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	• This target may be considered relevant to proposed activities or operations that will result in the permanent exclusion of harbour seal from part of its range within the site, or will permanently prevent access for the species to suitable habitat therein.	This attribute relates specifically to *permanent* exclusion of access to suitable habitat. The proposed works are temporary in nature and will be carried out over a period of less than 3 months. Therefore, proposed works do not have the potential to cause permanent (or temporary) exclusion of Harbour Seal or Grey Seal from part of their range, or to prevent access to suitable habitat within their range.

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
			• It does not refer to short-term or temporary restriction of access or range. • Early consultation or scoping with the Department in advance of formal application is advisable for proposals that are likely to result in permanent exclusion.	**There is no potential for adverse effects.**
Breeding behaviour	Breeding sites	The breeding sites should be maintained in a natural condition.	• This target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) breeding behaviour by harbour seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used during the annual breeding season. • Operations or activities that cause displacement of individuals from a breeding site or alteration of natural breeding behaviour, and that may result in higher mortality or reduced reproductive success, would be regarded as significant and should therefore be avoided.	Harbour seals are known to haul out on Tern Island and the exposed sand banks in Wexford Harbour. Harbour Seal are regularly seen along the River Slaney. Grey seals forage locally and it is likely seals encountered within the harbour are typically the same individuals occurring regularly with the harbour providing foraging opportunities as well as temporary haul out sites. The closest European site for Grey Seal is the Saltee Islands SAC, where they are known to haul and pup. These individuals of Grey Seal and Harbour Seal likely have a high level of habituation to noise and vessel movements in Wexford Harbour as they regularly occur in this area with high levels of anthropogenic activity. There is no potential for the proposed works to interfere with the breeding behaviour, moulting sites or resting haul out sites of these species or impact individuals with pups. **There is no potential for adverse effects.**
Moulting behaviour	Moult haul-out sites	The moult haul-out sites should be maintained in a natural condition.	• This target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) moulting behaviour by harbour seal within the site and/or (b) aquatic/terrestrial/intertidal	

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
			habitat used during the annual moult. • Operations or activities that cause displacement of individuals from a moult haul-out site or alteration of natural moulting behaviour to an extent that may ultimately interfere with key ecological functions would be regarded as significant and should therefore be avoided.	
Resting behaviour	Resting haul-out sites	The resting haul-out sites should be maintained in a natural condition	• This target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) resting behaviour by harbour seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used for resting. • Operations or activities that cause displacement of individuals from a resting haul-out site to an extent that may ultimately interfere with key ecological functions would be regarded as significant and should therefore be avoided.	
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site	• Proposed activities or operations should not introduce man-made energy (e.g. aerial or underwater noise, light or thermal energy) at levels that could result in a significant negative impact on individuals and/or the population	The proposed works are within the Slaney River Valley SAC which is designed for Harbour Seal. Therefore there is potential for in-situ underwater noise impacts.

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
			of harbour seal within the site. This refers to both the aquatic and terrestrial/intertidal habitats used by the species in addition to important natural behaviours during the species annual cycle. • This target also relates to proposed activities or operations that may result in the deterioration of key resources (e.g. water quality, feeding, etc) upon which harbour seals depend. In the absence of complete knowledge on the species' ecological requirements in this site, such considerations should be assessed where appropriate on a case-by-case basis. • Proposed activities or operations should not cause death or injury to individuals to an extent that may ultimately affect the harbour seal population at the site.	The nearest European site designated for Grey Seal is the Saltee Islands SAC which is 40km from the proposed works. Therefore there is potential for ex-situ impacts on Grey Seal as a result of underwater noise. The proposed works may produce underwater noise that would be in excess of thresholds to cause PTS, TTS or a behavioural shift in Grey Seal and Harbour Seal. **Therefore, adverse effects cannot be excluded.**
Atlantic Salmon				
Distribution: Extent of Anadromy	% of river accessible	100% of river channels down to second order accessible from estuary	• Artificial barriers can block salmons' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas	The proposed works will not introduce any physical barriers to the River Slaney. **There is no potential for adverse effects.**

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded	• A conservation limit is defined by the North Atlantic Salmon Conservation Organisation (NASCO) as "the spawning stock level that produces long-term average maximum sustainable yield as derived from the adult to adult stock and recruitment relationship". The target is based on the Standing Scientific Committee of the National Salmon Commission's annual model output of CL attainment levels. See SSC (2010). Stock estimates are either derived from direct counts of adults (rod catch, fish counter) or indirectly by fry abundance counts. The fish counter at Clohamon is used to assess the run of salmon on the Slaney. The Slaney is currently (2011) below its CL for both 1SW salmon (meeting 54%) & MSW salmon (meeting 34%)	The proposed works will result in underwater noise generation in the River Slaney. This could result in injury to adult salmon on their upstream migration. **Therefore, adverse effects cannot be excluded.**
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling	• Target is threshold value for rivers currently exceeding their conservation limit (CL)	Salmon fry inhabit fresh water. The proposed works are in the tidal reaches of the Slaney, therefore is no risk of the works affecting salmon fry abundance. **There is no potential for adverse effects.**

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
Out-migrating smolt abundance	Number	No significant decline	• Smolt abundance can be negatively affected by a number of impacts such as estuarine pollution, hydroelectric schemes, predation and sea lice (*Lepeophtheirus salmonis*)	The proposed works will result in underwater noise generation in the River Slaney. This could lead to a reduction in out-migrating smolt. **Therefore, there is potential for adverse effects and mitigation is required.**
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	• Salmon spawn in clean gravels	Salmon spawn in freshwater. The proposed works are in a tidal section of the River Slaney, therefore there is no risk of a reduction in the number of redds. **There is no potential for adverse effects.**
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	• Q values based on triennial water quality surveys carried out by the Environmental Protection Agency (EPA	The proposed works are in the lower tidal reaches of the River Slaney. Therefore, there is no potential for the proposed works to affect the Q-value of the EPA sample sites, which are located exclusively in freshwater. **There is no potential for adverse effects.**
Twaite Shad				
Distribution: Extent of Anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	• In some catchments, artificial barriers block twaite shads' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Barrier modification required to facilitate passage of adult fish within channels (Gargan et al., in press	The proposed works will not introduce any physical barriers to the River Slaney. **There is no potential for adverse effects.**
Population structure- age classes	Number of age classes	More than one age class present	• Regular breeding has not been confirmed in the River Slaney in recent years (King and Roche, 2008	The proposed works will result in underwater noise generation in the River Slaney. This could lead to a reduction in the number in the of upstream migrating Shad, which could in turn lead to a reduction in the number of age classes present.

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
				Therefore, there is potential for adverse effects and mitigation is required.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning habitats	• [none]	Twaite Shad spawn in the upper tidal reaches of rivers, which in this case is close to Enniscorthy. Given the distance between the proposed works and this area, it can be concluded that the proposed works will have no effect on the occurrence of spawning habitat. **There is no potential for adverse effects.**
Water quality-oxygen levels	Milligrammes per litre	No lower than 5mg/l	• Attribute and target based on Maas, Stevens and Briene (2008)	The proposed work involve ground investigations sediment sampling and environmental surveys and do not provide for any change to the oxygen levels in the SAC. **There is no potential for adverse effects.**
Spawning habitat quality: Filamentous algae; macrophytes; sediment	Occurrence	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth	• Salmon spawn in clean gravels	Twaite Shad spawn in the upper tidal reaches of rivers, which in this case is close to Enniscorthy. Given the distance between the proposed works and this area, it can be concluded that the proposed works will have no effect on spawning habitat quality. **There is no potential for adverse effects.**
River Lamprey				
Distribution: Extent of Anadromy	% of river accessible	Greater than 75% of main stem and major tributaries down to second order accessible from estuary	• Artificial barriers can block lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Barrier modification required to facilitate passage of adult fish within channels (Gargan et al., in press).	The proposed works will not introduce any physical barriers to the River Slaney. **There is no potential for adverse effects.**

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
Population structure of juveniles	Number of age/ size groups	At least three age/size groups of river/brook lamprey present	• Attribute and target based on data from Harvey & Cowx (2003). It is impossible to distinguish between brook and river lamprey juveniles in the field, hence they are considered together in this target.	The proposed works will result in temporary disturbance in a small tidal section of the River Slaney during the day. Lamprey migrate after dark, therefore the works will not lead to a reduction in the number of age classes in the SAC. **There is no potential for adverse effects.**
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²	• Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey & Cowx (2003) who state 10/m² in optimal conditions and more than 2/m² on a catchment basis.	The proposed works are in a tidal section of the River Slaney, therefore there is no potential for the works to reduce the density of juvenile lamprey in fine sediment, which occurs exclusively in fresh water. **There is no potential for adverse effects.**
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds	• Attribute and target based on spawning bed mapping by Inland Fisheries Ireland (IFI). Lampreys spawn in clean gravels.	The proposed works are in a tidal section of the River Slaney, therefore there is no potential for the works to reduce the area and occurrence of spawning habitat, which occurs exclusively in fresh water. **There is no potential for adverse effects.**
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	• Target based on studies by Central Fisheries Board (CFB)/IFI; Ecofact for NPWS (e.g. King and Linnane, 2004; O'Connor, 2007).	The proposed works are in a tidal section of the River Slaney, therefore there is no potential for the works to reduce the availability of juvenile habitat, which occurs exclusively in fresh water. **There is no potential for adverse effects.**

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
Sea Lamprey				
Distribution: Extent of Anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	• Artificial barriers can block or cause difficulties to lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. In this site, some barrier modification is required (e.g. Clohamon weir) to permit sea lamprey passage (Gargan et al., in press	The proposed works will not introduce any physical barriers to the River Slaney. **There is no potential for adverse effects.**
Population structure of juveniles	Number of age/ size groups	At least three age/size groups present	• Attribute and target based on Harvey and Cowx (2003)	The proposed works will result in temporary disturbance in a small tidal section of the River Slaney during the day. Lamprey migrate after dark, therefore the works will not lead to a reduction in the number of age classes in the SAC. . **There is no potential for adverse effects.**
Juvenile density in fine sediment	Juveniles/m²	Juvenile density at least 1/m²	• Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey and Cowx (2003)	The proposed works are in a tidal section of the River Slaney, therefore there is no potential for the works to reduce the density of juvenile lamprey in fine sediment, which occurs exclusively in fresh water. **There is no potential for adverse effects.**
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds. Improved dispersal of spawning beds into areas upstream of barriers	• Attribute and target based on spawning bed mapping by Inland Fisheries Ireland (IFI). Lampreys spawn in clean gravels	The proposed works are in a tidal section of the River Slaney, therefore there is no potential for the works to reduce the area and occurrence of spawning habitat, which occurs exclusively in fresh water. **There is no potential for adverse effects.**

Attribute	Measure	Target	Notes (as per conservation objectives supporting documentation)	Evaluation of potential adverse effects
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	• Target based on studies by Central Fisheries Board (CFB)/IFI; Ecofact for NPWS (e.g. King and Linnane, 2004; O'Connor, 2007)	The proposed works are in a tidal section of the River Slaney, therefore there is no potential for the works to reduce the availability of juvenile habitat, which occurs exclusively in fresh water. **There is no potential for adverse effects.**

Conclusion

The proposed works have the potential to result in underwater noise disturbance which could lead to PTS, TTS and/or behavioural change in Harbour Porpoise, Bottlenose Dolphin, Harbour Seal, Grey Seal, Twaite Shad and Atlantic Salmon. Therefore, it is considered that the proposed works have potential to lead to changes in the *disturbance* Attributes of Harbour Porpoise, Bottlenose Dolphin, Harbour Seal and Grey Seal as well as the *Adult Spawning Fish* and *Out-migrating Smolt Abundance* attributes for Atlantic Salmon. Therefore, the proposed works may result in adverse effects on these Qualifying Interests and therefore, mitigation is required.

4.3 Summary

In Sections 4.2, it was established that for six Qualifying Interest species, namely, Harbour Porpoise, Bottlenose Dolphin, Harbour Seal, Grey Seal, Twaite Shad and Atlantic Salmon for European Sites identified in Table 3.2 , that in the absence of appropriate mitigation, interruptions or delays in achieving certain Conservation Objectives for those sites, i.e., adverse effects on the integrity of those sites, as a result of the proposed works, cannot be ruled out. Therefore, mitigation is required to avoid these adverse effects, mitigation is presented in Section 5.

5. MITIGATION

5.1 Principles and Approach

Section 4 of this NIS assessed the adverse effects likely to arise from the proposed works on the specific Attributes and Targets which define the Conservation Objectives for the Qualifying Interests Harbour Porpoise, Bottlenose Dolphin, Harbour Seal, Grey Seal, Twaite Shad and Atlantic Salmon for the various European Sites in which they are designated. This section prescribes mitigation measures to ensure their full and proper implementation aimed at mitigating these adverse effects, thereby protecting the integrity of these European sites during the proposed works.

The mitigation measures prescribed in this NIS have been designed according to the principle of a mitigation hierarchy, as outlined in the European Commission's guidance document *Assessment of plans and projects in relation to Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (EC, 2021). According to this hierarchy, mitigation measures first suggest *avoidance* (i.e. preventing significant impacts from happening in the first place) and then *reduction* of impact (i.e. reducing the magnitude and/or likelihood of an impact).

As mitigation measures are related directly to impacts and only indirectly to receptors and as, in this case, all of the affected receptors have been identified as being affected the same set of impacts, to describe mitigation measures under the headings of the relevant receptors would lead to undue repetition. Therefore, the measures prescribed in this NIS are described under the headings of the types of impacts which they are intended to mitigate.

The mitigation measures are prescribed in Section 5.2 and a protocol to ensure their full and proper implementation is prescribed in Section 5.3. The significance of any residual effects following the inclusion of mitigation measures is evaluated in Section 5.4. As per the assessment of adverse effects in Section 4, this evaluation is made in view of the relevant Conservation Objectives.

5.2 Mitigation Measures

5.2.1 Underwater noise disturbance- Marine Mammals

This section presents the mitigation measures that are required to be implemented during the proposed GI works to avoid potential underwater noise impacts on marine mammals. All of the mitigation measures shall be implemented in full. The mitigation measures are based on the *Guidelines to Manage Risk to Marine Mammals from Man–Made Sounds in Irish Waters* (NPWS, 2014d). The mitigation measures are set out below:

(1) A qualified and experienced marine mammal observer (MMO) shall be appointed to monitor for marine mammals and to log all relevant events using standardised data forms.

(2) Unless information specific to the location and/or plan/project is otherwise available to inform the mitigation process (e.g., specific sound propagation and/or attenuation data) and a distance modification has been agreed with the Regulatory Authority, underwater cable percussive GI and the use of the sub bottom profiler will not commence if marine mammals are detected within the Monitored Zone.

(3) Underwater cable percussive GI and the use of the sub bottom profiler shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible, the sound-producing activities shall be postponed until effective visual monitoring is possible.

(4) An agreed and clear on-site communication signal must be used between the MMO and the works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break. It shall only proceed on positive confirmation with the MMO.

(5) In waters up to 200m deep, the MMO shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.

(6) This prescribed Pre-Start Monitoring shall subsequently be followed by an appropriate Ramp-Up Procedure which should include continued monitoring by the MMO.

(7) In commencing a GI or environmental surveys where the output peak sound pressure level (in water) from any source including equipment testing exceeds 170 dB re: 1µPa @1m an appropriate Ramp-up Procedure (i.e., "soft-start") must be used.

(8) Where it is possible according to the operational parameters of the equipment and materials concerned, the underwater acoustic energy output shall commence from a lower energy start-up (i.e., a peak sound pressure level not exceeding 170 dB re: 1µPa @1m) and thereafter be allowed to gradually build up to the necessary maximum output over a period of 20-40 minutes.

(9) This controlled build-up of acoustic energy output shall occur in consistent stages to provide a steady and gradual increase over the ramp-up period.

(10) Where the measures outlined in steps 8 and 9 are not possible, alternatives must be examined whereby the underwater output of acoustic energy is introduced in a consistent, sequential and gradual manner over a period of 20-40 minutes prior to commencement of the full necessary output.

(11) In all cases where a Ramp-Up Procedure is employed the delay between the end of ramp-up and the necessary full output must be minimised to prevent unnecessary high-level sound introduction into the environment.

(12) Once an appropriate and full Ramp-Up Procedure commences, there is no requirement to halt or discontinue the procedure at night-time (if permitted), nor if weather or visibility conditions deteriorate nor if marine mammals occur within the Monitored Zone.

(13) If there is a break in sound output for a period greater than 30 minutes (e.g., due to equipment failure, shut-down or location change) then all Pre-Start Monitoring and a subsequent Ramp-up Procedure (where appropriate following Pre-Start Monitoring) must be undertaken.

(14) For higher output drilling operations which have the potential to produce injurious levels of underwater sound as informed by the associated risk assessment, there is likely to be a regulatory requirement to adopt shorter 5-10 minute break limit after which period all Pre-Start Monitoring and a subsequent Ramp-up Procedure (where appropriate following Pre-Start Monitoring) shall recommence as for start-up.

5.2.2 Underwater noise disturbance- Atlantic Salmon, Twaite Shad.

The mitigation measures in place for marine mammals, in particular the soft start/ ramp-up procedure, will ensure that the risk of PTS and TTS from the proposed works is avoided.

5.3 Implementation

In order to give effect to the mitigation prescribed in this NIS, it should be a condition of any consent granted in respect of the proposed works that all of the mitigation, including monitoring and enforcement, prescribed in this NIS be binding, during the works phase, on the Contractor. Accordingly, all of the mitigation prescribed herein shall be transposed into the Contract Documents for the ground investigation works and environmental surveys.

During the works, all works must comply with relevant legislation and guidelines in order to reduce and minimise environmental impacts and to protect all ecological receptors. In particular, there must be full compliance with the following:

- The mitigation prescribed in this NIS.
- Any conditions which might be attached to the proposed works licence conditions.
- Any requirements of stakeholders and statutory bodies, e.g., the NPWS and IFI, including:
    - *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* (NPWS, 2014).
- All applicable legislative requirements in relation to environmental protection.
- The Transport Infrastructure Ireland (TII) Environmental Assessment and Construction Guidelines, specifically:
    - *Guidelines for the Treatment of Noise and Vibration in National Road Schemes.*

This list is non-exhaustive. All environmental commitments/requirements and relevant legislation and guidelines which are current at the time of construction will be followed.

5.4 Residual Effects

Following the inclusion of the mitigation measures in Section 5.2.2 (Underwater Noise Disturbance), the probability of impacts from underwater noise disturbance arising from the proposed works is very low and the significance of any such impacts, if they were to occur, would be negligible. Therefore, it can be concluded beyond reasonable scientific doubt that any residual impacts from underwater noise disturbance arising from the proposed works will not constitute adverse effects on the integrity of the European sites in the zone of influence designated for Harbour Porpoise, Bottlenose Dolphin, Harbour Seal, Grey Seal, Twaite Shad and Atlantic Salmon.

6. IN-COMBINATION EFFECTS

6.1 Introduction

Article 6(3) of the Habitats Directive requires that AA be carried out in respect of plans and projects that are likely to have significant effects on European sites, "either individually or in combination with other plans or projects". Therefore, the combined effects of the plan or project under assessment and other past, present or foreseeable future plans or projects must also be examined, analysed and evaluated.

6.2 Methodology

An area of 10km in the foreshore area from the proposed works was selected for the assessment of in-combination effects to include developments with reasonable potential for in-combination impacts, whilst excluding those areas which are non-viable because of issues such as topography and distance.

In-combination or cumulative effects result from incremental changes caused by other past, present or reasonably foreseeable projects together with the proposed works. Such effects were assessed by examining previous plans and projects, current plans and projects in planning and proposed future plans and projects within the specified geographic area around the proposed works from 2020 to the present. There is too much uncertainty associated with proposals beyond 5 years into the future and this NIS must be based on data that is readily available. The assessment in this NIS has considered in-combination effects that are:

(a) Likely;

(b) Significant; and,

(c) Relating to a future event which is reasonably foreseeable.

The following data sources have been consulted to identify the plans and projects within the specified geographic area:

- Wexford County Council Planning Portal (WCC, 2026)
- An Coimisiún Pleanála Website (ACP, 2026);
- Projects listed on the EIA Portal (DoHLG, 2026); and
- Foreshore Licence Application Website.

6.3 Assessment of Effects

Table 6.1 below details the assessment of the likelihood of significant effects arising from the proposed works in combination with other plans or projects. This assessment was undertaken in view of the Conservation Objectives of the relevant European sites and found that, given the implementation of the mitigation measures in Section 5 of this NIS, the proposed works does not have the potential to significantly affect any European site in combination with other plans or projects.

Table 6.1 Assessment of adverse effects arising from the proposed works in-combination with other plans or projects.

Plan or Project	Description of Plan or Project	In-Combination Effect(s)
Wexford County Council **Reference no:** 20150540 **Applicant:** Thomas Mcguinness **Address:** Newtown, Carrick, Co. Wexford	**Planning Application Lodged:** 03/07/2015 **Decision date:** 14/08/2015 Permission for the erection of a bar and restaurant and all associated site works including car parking facilities, connection to mains sewerage and road junction improvement works to the national primary route N11. The proposed development represents the substantial replacement of the former "oak tavern" building (previously permitted planning permission no. 20100345).	The proposed environmental surveys and GI works are located within 100m northwest of the project, which is located on the southern bank of the River Slaney, directly upstream of the Ferrycarrig Bridge. An Appropriate Assessment Screening Report was prepared for the project which concluded that there would be no likely significant effect on any European site as a result of the project, alone or in combination with other plans or projects. Given this, and considering the nature and scale of the proposed works, no adverse effects are predicted to arise from the project in-combination with the proposed works.

Plan or Project	Description of Plan or Project	In-Combination Effect(s)
Wexford County Council **Reference no:** 20231061 **Applicant:** Ferrycarrig Hotel Ltd **Address:** Ferrycarrig, Kilpatrick, Co. Wexford	**Planning Application Lodged:** 06/09/2023 **Decision date:** 09/02/2024 Permission for retention of development comprising of an earthen bund, 119 metres long and varying in height from 600-1100mm high to mitigate against the risk of tidal flooding to the hotel building. The development is located within the Wexford Harbour and Slobs SPA and Slaney River Valley SAC.	The proposed environmental surveys and GI works are located within 250m northwest of the project, which is located downstream on the western bank of the River Slaney, directly north of the Ferrycarrig Bridge. An Appropriate Assessment Screening Report was prepared for the project which concluded that there would be no adverse effect on any European site as a result of the project, alone or in combination with other plans or projects. Given this, and considering the nature and scale of the proposed environmental surveys, no adverse effects are predicted to arise from the project in-combination with the proposed works.
An Coimisiún Pleanála **Case reference:** TA26.308002 **Applicant:** Wm. Neville & Sons Unlimited **Address:** Carcur Park, Wexford Town, Co. Wexford	**Planning Application Lodged:** 21/08/2020 **Decision date:** 03/12/2020 Planning is sought for a total of 413 residential units consisting of 175 houses (12 four bedroom detached houses + garages, 20 four bedroom semi-detached houses, 2 four bedroom corner detached houses, 80 three bedroom semi-detached houses, 20 three bedroom terraced houses, 7 three bed end of terrace houses, 4 three bedroom corner houses, 20 two bedroom terraced houses, 6 two bedroom end of terrace, 4 semi-detached houses) and 7 apartment blocks with a total of 238 apartments together with two crèche facilities (Crèche A: 346.4 sqm floor area. Crèche B 395.3sq.m floor area). A total of 767 car parking spaces (248 private parking spaces, 501 public spaces and 18 creche spaces) and all associated site works.	The proposed environmental surveys and GI works are located approx. 1.7km northwest of the project site via linear distance, and 1.9km upstream. An NIS was prepared for the project, which outlined a number of mitigation measures, including for water quality and disturbance. Provided the mitigation measures presented in the NIS are adhered to, and considering the nature and scale of the proposed environmental surveys, no effects are predicted to arise from the project in-combination with the proposed works.

7. CONCLUSION

This NIS has been prepared in accordance with the relevant provisions of the Habitats Directive, the Habitats Regulations, as well as the relevant case law and current guidance. It has demonstrated that, in the absence of appropriate mitigation, the proposed works, individually or in combination with other plans or projects, would adversely affect the integrity of European sites designated for the Qualifying Interests Harbour Porpoise, Bottlenose Dolphin, Harbour Seal, Grey Seal, Twaite Shad and Atlantic Salmon, In light of this finding, this NIS has prescribed appropriate mitigation to eliminate or minimise such effects. Any residual effects, either individually or in combination with other plans or projects, have been assessed as not constituting adverse effects on the integrity of any European site. This assessment has been undertaken on the basis of the best scientific knowledge in the field and the Precautionary Principle and no reasonable scientific doubt remains as to the absence of such effects.

It is the considered opinion of ROD, as the author of this NIS, that, in making its AA in respect of the proposed works, MARA, as the Competent Authority in this case, should determine that, given the full and proper implementation of the mitigation prescribed in this NIS, the proposed works, either individually or in combination with other plans or projects, will not adversely affect the integrity of European sites designated for the Qualifying Interests Harbour Porpoise, Bottlenose Dolphin, Harbour Seal, Grey Seal, Twaite Shad, Atlantic Salmon, or any other European site.

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APPENDIX A
Location of Ground Investigation Works