Celtic Interconnector

Volume 6B

Appropriate Assessment Screening Report and Natura Impact Statement

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EIRGRID

The Oval, 160 Shelbourne Road, Ballsbridge, Dublin D04 FW28
Telephone: 01 677 1700 • www.eirgrid.ie

Report for

EirGrid plc and Réseau de Transport d'Électricité

Main contributors

Issued by

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Approved by

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Wood

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Summary

The Celtic Interconnector Project is a proposed electrical link between Ireland and France that will enable the import and export of electricity between the two countries. It will be the first direct energy link between Ireland and France and is being developed by EirGrid plc (EirGrid) and Réseau de Transport d'Électricité (RTE), the Transmission System Operators (TSOs) in Ireland and France, respectively.

Once installed, the cable will transmit electricity using high voltage direct current (HVDC) technology between Ireland and France.

The Celtic Interconnector cable route will pass through Ireland's Territorial Waters, the Irish Exclusive Economic Zone (EEZ), the United Kingdom's (UK's) EEZ, the French EEZ, and French Territorial Waters. The landfall locations are in County Cork on the south coast of Ireland and on the coast of Brittany in north west France (Nord-Finistère).

Under the EU Regulation for the Trans-European Energy Infrastructure (2013/347/EU) (hereafter referred to as the TEN-E Regulation), the Celtic Interconnector Project must comply with the consenting processes of all relevant jurisdictions, including those arising from Article 42 of the European Communities (Birds and Natural Habitats) Regulations 2011 as amended (The Regulations) which transpose the requirements of Article 6(3) of the EU Habitats Directive 92/43/EEC, in the Irish foreshore territorial waters, and EEZ.

For the purposes of this Report, the Proposed Development comprises the cable route in Irish waters below the mean High Water Mark (HWM), and the landfall at Claycastle approximately 2km south west of the town of Youghal, Co. Cork where it will be connected to onshore infrastructure.

From its crossing point with the UK EEZ, the submarine cable route within the Irish EEZ runs north westerly covering a distance of approximately 211 km.

This AA Screening Report and Natura Impact Statement' (hereafter simply 'Report') assesses the Irish elements of the Celtic Interconnector Project which are below mean HWM including Irish territorial waters, and the Irish EEZ. These Irish elements are hereafter referred to as the Proposed Development.

EirGrid is the Applicant for the Proposed Development, to which this report relates.

This Report provides the necessary information for the public authority (in this case, the foreshore unit of the Department of Housing, Local Government and Heritage), to discharge their duties under the Regulations, thereby fulfilling the requirements of Article 6(3) of the EU Habitats Directive 92/43/EEC.

Specifically, as required under the Regulations, the AA Screening Report (i.e. Section 2 of this Report) accompanies the foreshore licence application for the Proposed Development, because the Proposed Development is not directly connected with or necessary to the management of the site as a European Site. The AA Screening Report will inform the AA Screening of the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if the Proposed Development, individually or in combination with other plans or projects is likely to have a significant effect on any European sites.

The Applicant concluded in the AA Screening Report herein, that it could not be excluded [emphasis added], on the basis of objective scientific information that the Proposed Development, individually or in combination with other plans or projects, will have significant effects on two European sites (Ballymacoda Bay Special Protection Area (SPA) and Blackwater Estuary SPA). As such, the Applicant produced a Natura Impact Statement (NIS) (Section 3) to inform the AA determination of the public authority.

The conclusion of the Applicant's NIS is that, following implementation of mitigation measures, the Proposed Development will not adversely affect the integrity of any European sites, either alone or in combination with other plans or projects (including other elements of the Celtic Interconnector Project)

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1 Introduction

1.1 Overview of Celtic Interconnector Project

The Celtic Interconnector is a joint project being developed by EirGrid plc (EirGrid) and Réseau de Transport d'Electricité (RTE) and is being supported by the European Union's Connecting Europe Facility (CEF). It is also a European Union Project of Common Interest (PCI) and a designated e-Highway 2050 project. The Celtic Interconnector Project entails the construction and operation of a subsea electrical interconnector between County Cork on the south coast of Ireland and the coast of Brittany in north west France (Nord-Finistère). This infrastructure passes through Irish Territorial Waters, the Irish Exclusive Economic Zone (EEZ), the UK EEZ, French EEZ and French Territorial Waters.

1.2 Overview of Proposed Development

For the purposes of this Report, Proposed Development comprise the cable route proposed to come ashore in Ireland at the landfall at Claycastle approximately 2km south west of the town of Youghal, Co. Cork where it will be connected to onshore infrastructure.

From its crossing point with the UK EEZ, the cable route within the Irish EEZ runs north westerly covering a distance of approximately 211 km.

1.3 Purpose of this Report

This AA Screening Report and Natura Impact Statement' (hereafter simply 'Report') has been produced for the purpose of providing the public authority (in this case the foreshore unit of the Department of Housing, Local Government and Heritage), with the information necessary to carry out AA Screening and AA for the Irish elements of the Celtic Interconnector Project which are below mean High Water Mark (HWM), including Irish territorial waters, and the Irish EEZ. These Irish elements are hereafter referred to as the Proposed Development.

In this way, this Report addresses effects of the Project on European sites[1], to allow the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of relevant European sites, whether the Project individually or in combination with other plans or projects (including other Celtic Interconnector Project elements in the UK and French jurisdictions) will adversely affect the integrity of any European sites.

This NIS provides the methodology used to define the scope of the screening assessment and identify potential effects on European sites associated with the Project individually, and in-combination with other plans or projects (Stage 1: screening) and further provides an appropriate assessment (AA) for each site for which a Likely Significant Effect (LSE) could not be ruled out at the screening stage (Stage 2: appropriate assessment).

European sites include, due to protection through legislation, Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSACs) and Special Protection Areas (SPAs).

1.4 UK European Sites and this Report

It is acknowledged that following the United Kingdom's departure from the European Union, SACs and SPAs in the UK are no longer considered "European Sites" for the purpose of an assessment pursuant to Article 6(3) of the Habitats Directive. However, pursuant to the UK's Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, those sites still retain the same protection under UK law as they did prior to the UK's exit from the EU. In line with Ireland's obligations as a signatory to the Bern Convention on the Conservation of European Wildlife and Natural Habitats, to which Directive 92/43/EEC and Directive 2009/147/EC give effect, and in order to ensure the highest level of protection for the species and habitats protected by those Directives, the assessment includes a full assessment of the UK sites formerly forming part of the network of sites protected

[1] European sites include, due to protection through legislation, Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSACs), Special Protection Areas (SPAs).

under those Directives. This will enable the competent authority to ensure that there will no adverse effect on the integrity of those UK sites

1.5 Legislative Overview

Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) provides, inter alia, a framework for the protection of European sites. The Habitats Directive is transposed into Irish legislation for areas within the Irish EEZ and Irish Territorial Waters by the European Communities (Birds and Natural Habitats) Regulations, 2011, as amended.

The European Commission's methodological guidance (European Commission 2001, 2018) promotes a four-stage process for the assessment of the implications of plans or projects on European sites. This process is termed the appropriate assessment and guidance in completing it is outlined in 'Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities' published by the Department of Environment, Heritage and Local Government (2009) (referred to hereafter as the 'Irish Article 6(3) Guidance' for brevity).

The public authority must comply with Regulation 42 of the European Communities (Birds and Natural Habitats) Regulations 2011-2015, including the following:

42 (1):A screening for appropriate assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in-combination with other plans or projects is likely to have a significant effect on the European site.

42 (6): The public authority shall determine that an Appropriate Assessment of a plan or project is required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it cannot be excluded, on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site.

42 (12): In carrying out an Appropriate Assessment under paragraph (11) the public authority shall take into account each of the following matters—

(a) the Natura Impact Statement,

(b) any other plans or projects that may, in combination with the plan or project under consideration, adversely affect the integrity of a European Site,

(c) any supplemental information furnished in relation to any such report or statement,

(d) if appropriate, any additional information sought by the authority and furnished by the applicant in relation to a Natura Impact Statement,

(e) any information or advice obtained by the public authority,

(f) if appropriate, any written submissions or observations made to the public authority in relation to the application for consent for proposed plan or project,

(g) any other relevant information.

42 (5): A Natura Impact Statement shall…include such information or data as the public authority considers necessary…to enable it to ascertain if the plan or project will affect the integrity of the site."

The appropriate assessment is a staged process that is described in the Irish Article 6(3) Guidance as:

- Stage 1 - Screening: Screening for LSE. If no LSE are identified, then an appropriate assessment will not be required;
- Stage 2 - Appropriate assessment: If Stage 1 identifies LSE, it is necessary to assess the implications of the Project on the affected site(s)' conservation objectives.

Both Stages are covered by Regulation 42 (as stated above).

The Applicant is required to provide the public authority with such information as considered necessary for the purpose of assessment or to enable it to determine whether an appropriate assessment is required, as outlined in Regulation 42 (3);

> *"At any time following an application for consent for a plan or project, a public authority may give a notice in writing to the applicant, directing him or her to—*
>
> *(a) furnish a Natura Impact Statement and the applicant shall furnish the statement within the period specified in the notice, and*
>
> *(b) furnish any additional information that the public authority considers necessary for the purposes of this Regulation."*

1.6 Structure of AA Screening Report and NIS

This Report provides the information necessary to enable the public authority to undertake an appropriate assessment of the Proposed Development. The Report is structured as follows:

- the methodology used for informing the screening and appropriate assessment of the Celtic Interconnector alone (Section 1.4);
- the methodology used for informing the screening and appropriate assessment of the Proposed Development in-combination with other plans and projects, including other elements of the Celtic Interconnector Project (Section 1.4);
- determination of whether the Proposed Development is necessary for or connected with the management of any European site (Section 2.1);
- a description of the receiving environment (Section 2.2);
- a description of the Proposed Development (Section 2.3);
- the identification of potential effects associated with the Proposed Development and the zones of influence within which they may operate (Section 2.4);
- an assessment to determine the presence of LSE (Section 2.5); and
- an appropriate assessment of LSE identified at the screening stage (Section 3).

1.7 Related Reporting on the Celtic Interconnector Project

Effects of the Irish elements of the Celtic Interconnector Project above the HWM, and the respective effects of the UK and French elements of the Celtic Interconnector Project on European sites (in combination with other plans and projects, including the Proposed Development, and each other) are respectively reported on in:

- Volume 6A for Irish elements above the HWM;
- Volume 11 for elements in UK waters; and,
- Volume 5: for the French jurisdiction (reported within the Joint Environmental Report, JER).

1.8 Competent Experts

This assessment has been undertaken by suitably qualified and experienced individuals within Wood Plc's ecology teams, drawing on data including that gathered on site-specific surveys, as commissioned by EirGrid and RTE within the Irish marine and terrestrial environments.

Full details of Wood's team are provided within Volume 3D, Part 1, Appendix 1A. Data was gathered by:

- Glas Ecology;
- Aquafact; and
- Next Geosolutions.

1.9 Methodology

1.9.1 Screening Process

The applicable test of the screening stage was documented within the decision for Waddenzee (C-127/02 – Paragraph 3a): “In the light of the precautionary principle, a risk of significant effects exists if it cannot be excluded on the basis of objective information that the plan or project will have significant effects on the conservation objectives of the site concerned; in case of doubt as to the absence of significant effects an appropriate assessment must be carried out. All aspects of the plan or project which can, either individually or in-combination with other plans or projects, affect those objectives must be identified in the light of the best scientific knowledge in the field.”

The screening stage has been characterised by the European Commission Guidance (2001, 2018) as follows; ‘Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC’ (“the European Commission Guidance”)’ as a four-step process. These steps are:

1. determining whether the Proposed Development or plan is directly connected with or necessary to the management of any European site(s);
2. describing the Proposed Development and the description and characterisation of other projects or plans that in-combination have the potential for having significant effects on a European site (s);
3. identifying the potential effects on a European site(s); and
4. assessing the significance of any effects on a European site(s).

When each of these steps has been worked through there are three potential outcomes:

- The Proposed Development is directly connected with or necessary to the management of a European site(s) and therefore does not require appropriate assessment (Stage 2).
- One or more LSEs on designated features of European sites are identified and the Project requires an appropriate assessment.
- No LSEs on designated features of European sites are identified as there is no pathway by which such effects could occur, or they can be excluded on the basis of objective information and therefore there is no requirement for an appropriate assessment.

In order to determine whether the Proposed Development is capable of resulting in one or more LSEs on a European site(s) it is necessary to understand the activities associated with the installation, operation and maintenance and decommissioning of the Proposed Development (e.g. the positioning of external cable protection), the potential changes that may occur in the environment as a result (e.g. the production of installation noise), and the effects that this may have on designated features of European sites (e.g. disturbance of marine mammals resulting in increased energy expenditure and reduced energy intake resulting in potential lower survival and productivity rates).

Through the use of this *activity – change – effect* concept, it is possible to identify European sites (and their qualifying features) that may be subject to LSEs through the determination of a series of search parameters. These search parameters can then be extended to identify the other plans and projects that require consideration within the assessment of in-combination effects.

1.9.2 Methodology – Identification of the European sites that could be affected by a project

The European sites that should be considered within the screening process are those where, in light of the precautionary principle, the risk of significant effects from the Proposed Development alone and/or in-combination with other plans and projects cannot be excluded on the basis of objective evidence and taking into account the Zone of Influence (ZoI) of identified effects.

The current guidance on ecological assessments (CIEEM, 2018) states that:

"The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries" and that "the zone of influence will vary for different ecological features depending on their sensitivity to an environmental change."

The ZoI varies depending on the construction and operational activity and the sensitivity of the receptor (e.g., flora, birds, terrestrial mammals) to the effect encountered.

Key to determining which European sites are included within this consideration is an understanding of the activities associated with Proposed Development, the geographical scale over which changes due to the different activities may be detectable and the types of receptors (in other words designated features) susceptible to them[2]. An effective and efficient way to determine these relationships in a structured and transparent way is through the use of an *activity – change – effect* model.

Central to the identification of European sites for consideration within the screening process, is the ability to define evidence-based search parameters. In order to achieve this, the following steps are followed (see Table 2.1 for further detail):

- Identification of the activities associated with the installation, operation and decommissioning phases that have the potential to result in changes to background environmental parameters (for example seabed damage);
- Determination of the changes that could occur as a result of the activities identified;
- Determination of the distance over which these changes may occur based on published literature, outputs from the ecological assessment process and/or professional judgement; and
- Identification of the potential designated features (based on Annex II species listed on the Habitats Directive and Annex I birds listed on the Birds Directive, including functional habitat requirements) that may be affected by the identified changes.

Key documents used through this process included the following references:

- Cutts, N.D, Hemingway, K., and Spencer, J. (2013). Waterbird Disturbances Mitigation Toolkit: Informing Estuarine Planning & Installation Projects. Institute of Estuarine & Coastal Studies, University of Hull.
- Cutts, N.D., Phelps, A., and Burdon, D, (2009). Installation and waterfowl: Defining sensitivity, response, impacts and guidance. Report to Humber INCA, Institute of Estuarine & Coastal Studies, University of Hull.
- Sea Mammal Research Unit (SMRU) (2011) Scientific Committee On Seals (SCOS) Scientific advice on matters related to the management of seal populations: 2011.
- Taormina, B., Bald, J., Want, A., Thouzeau, G., Lejart, M., Desroy, N., & Carlier, A. (2018). A review of potential impacts of submarine power cables on the marine environment: Knowledge gaps, recommendations and future directions. Renewable and Sustainable Energy Reviews, 96, 380-391.
- Thompson, P. M., McConnell, B. J., Tollit, D. J., MacKay, A., Hunter C., and Racey. P. A. (1996) Comparative distribution, movements and diet of harbour and grey seals from Moray Firth, NE Scotland. Journal of Applied Ecology, 33(6):1572-1584.
- Woodward, I., Thaxter, C. B., Owen, E., Cook, A. S. C. P. (2019). Desk-based revision of seabird foraging ranges used for HRA screening. BTO Research Report No. 724.

The outcome of these steps is a series of search parameters based on potential pathways of effect that can then be used to determine both the European sites for inclusion within the process, due to their physical proximity to the Proposed Development, and those linked by way of mobile fauna and associated functional habitat.

[2] This includes habitats and species that are not designated features but help underpin the conservation objectives of a European site (for example habitats supporting designated features).

Mobile designated features of European sites (i.e. seabirds or marine mammals) may interact with the proposed development when remote from the relevant European site. In order to identify species and sites where interactions could occur remotely from European Sites the following approaches have been taken;

For seabirds, the mean maximum foraging distances from Woodward et al. (2019) are used to identify SPA sites with breeding seabirds as designated features. For cetaceans, the relevant management units covering the Irish and Celtic seas have been applied (IAMMWG, 2015); For seals a distance of 145km has been applied for grey seal (Thompson et al. 1996) and 120km for common seal (SMRU 2011). For migratory fish, a precautionary search area 100km from the cable route has been applied.

Desktop information on European sites within Ireland has been gathered using the National Parks and Wildlife Service (NPWS) website and map viewer.

European sites within the UK and French jurisdictions have been identified from the Joint Environmental Report (Volume 5 of the EIAR). This is on the basis that the same cable laying and protection works will also take place within UK and French waters at closer distances to European sites within their jurisdictions.

1.9.3 Methodology – Identifying in-combination effects and other plans or projects for inclusion

Effects on European sites may result from the Proposed Development alone and/or in-combination with other plans or projects. Relevant guidance includes that from the European Commission (2001 and 2018a, 2018b, 2020) and the Ospar Commission (2012). These sources have informed the methods used for the in-combination assessment in the case of the Proposed Development.

The identification of plans and projects to include within the in-combination assessment follows the same methodology as that outlined above for the identification of European sites relevant to the Proposed Development. Key to the inclusion of other plans and projects within the assessment are the spatial and temporal overlaps that may occur due to the scale of potential changes (for example overlaps in the zones of disturbance caused by simultaneous installation activity) or the areas over which potential receptors may travel (for example a bird may pass through several areas where development is proposed when moving between roosting and feeding grounds in or between designated sites). Existing activities in the area of the Proposed Development including shipping and commercial fishing activities are unlikely to change significantly during the duration of the installation activities (where vessel presence is directly relevant) and is therefore considered to be part of the baseline situation.

Within the search areas the types of projects and plans included within the assessment of in-combination effects are:

- projects that are under installation;
- permitted application(s) not yet implemented;
- submitted application(s) not yet determined (including other elements of the Celtic Interconnector Project);
- all refusals subject to appeal procedures not yet determined; and
- projects identified in land-use plans including the relevant development plan.

Following the identification of plans and projects within the search areas, an initial screening is then undertaken to filter out:

- minor proposals (e.g. installation of marker buoys, removal of marine litter / minor dropped objects, minor maintenance of existing structures) with no potential to cause LSE in-combination; and
- proposals with no potential to overlap the Proposed Development due to differing timescales for construction, operation and/or decommissioning.

Those that are to be included within the in-combination assessment are then considered with regard to the identified potential effects.

The above approach has been undertaken to inform both the AA Screening Report, and NIS.

1.9.4 Methodology for determining Potential Significant Effects

The AA screening process uses the threshold of LSE to determine whether effects on European sites should be the subject of further assessment. The Habitats Directive do not define the term LSE. However, in the Waddenzee case (Case C-127/02) the European Court of Justice found that an LSE exists if it cannot be excluded on the basis of objective information that the plan or project will have significant effects on the conservation objectives of the site concerned, whether alone or in-combination with any other project.

For the purposes of this screening stage, an LSE is defined as any identified effect that is capable of resulting in a change that is contrary to the conservation objectives of one or more designated features of a European site after all aspects of the plan or project have been considered alone and in-combination with other plans and projects.

This screening assessment does not consider any measures intended to avoid or reduce harmful effects on European sites.

Within this screening assessment, each potential effect is considered using best available scientific knowledge, and objective information, and specifically information from surveys, published literature (where available), other available baseline data, the design of the Proposed Development and professional judgement (informed by CIEEM, 2018). Where a potential effect has been identified but no LSE is predicted the evidence and reason for reaching this conclusion is provided (see Table 2.7 and Table 2.8).

1.9.5 Methodology for Field Surveys

Benthic and Intertidal Surveys

Data on benthic habitats and fauna was gathered along the proposed route of the Celtic Interconnector in two campaigns carried out in 2015 and 2018 respectively. Seabed acoustic surveys and geophysical surveys were undertaken, bathymetry measured, and samples of benthos and sediment collected using both a Hamon grab and seabed photography (stills and video). Over the course of the survey campaigns, data was collected from locations that are no longer under consideration (that is, data gathered to inform the optioneering stage), although the wider dataset is considered appropriate to inform the NIS through the provision of additional, contextual data and information. Sediment composition was identified as the greatest factor influencing diversity of macrofaunal communities along the route.

Marine Mammals and Reptiles

Marine mammal observers (MMOs) were operational onboard the 2014 and 2017 geophysical survey vessels in Irish waters, following consultation and agreement with NPWS. Whilst focusing on marine mammals, the survey methodology dictates that surveyors are also instructed to record any sightings of marine reptiles. Throughout all works, suitably qualified MMOs followed the DAHG guidelines established by the NPWS, recording continuously as appropriate. The findings from this work have been incorporated into the baseline description below.

Wintering Bird Surveys

Ornithological surveys of the intertidal and nearshore environments have been carried out within the Zone of Influence of the proposed landfall location at Claycastle Beach[3]. Surveys took place over three seasons to capture wintering bird activity in February and March 2019, and again monthly between November 2019 and March 2020, and throughout winter 2020 / 2021. with breeding bird activity recorded between April and June 2019. These surveys provide an understanding of the occurrence of waders, wildfowl, raptors, and seabirds using the intertidal, nearshore, and coastal inshore areas across the year.

Wetland bird surveys undertaken from 2019 to 2021 within the intertidal areas and adjoining fields at Redbarn – Claycastle Beach (covering approximately 2.1km of the beach and 9ha of agricultural fields). The working area at the landfall point at Claycastle is approximately 20m wide, and therefore occupies only a small proportion of the

[3] Surveys were also carried out at Redbarn and Ballinwilling, to inform optioneering under Step 4 of EirGrid's Framework – see Srep 4 reporting online at https://www.eirgridgroup.com/the-grid/projects/celtic-interconnector/related-documents/index.xml

survey area. The survey area was split into five count sectors (plus some fields behind the beach), with the proposed landfall area being on the boundary between count sections three and four. Count sectors three and four are the only sectors which are within the 400m ZoI identified with respect to wetland birds in the intertidal area.

Initial surveys were completed in February and March 2019 at high tide and low tide, following a methodologies based on the Irish Wetland Bird Survey (I-WeBS) methodology (Boland and Crowe, 2012) (for high tide counts) and similar methods for low tide counts (Lewis and Tierney, 2014). The high-tide counts used a 'snapshot' approach, recording the number of birds present over high tide only whilst the low tide counts used a four-hour observation period, centred on low tide.

Between November 2019 and March 2020 and October 2020 and March 2021 the same area was surveyed using similar methods though the high tide counts were extended to four hours of observation, centred on high tide (as per the low tide methodology. Each month four hours of observation were completed around low tide and high tide. Additional watches of the nearshore to observe marine/coastal birds which used areas immediately adjacent to the proposed cable route were completed between November 2019 and March 2020.

At sea, no targeted surveys have been undertaken to identify seabirds commuting or foraging along the route of the Celtic Interconnector. Given the largely sub-surface nature of the Project and the third-party data available, no dedicated survey effort was considered necessary to inform this assessment.

Across all surveys the survey area was split into five count sectors (plus some fields behind the beach) covering approximately 2.1km of linear beach from Redburn – Claycastle. Figure 1.1 shows the boundaries of these survey areas.

Figure 1.1 Bird survey count sector boundaries (taken from Mott MacDonald 2020)

The bird data gathered represents a multi-year understanding of the bird populations present within the area throughout the non-breeding period with, the repeat visits providing for a robust assessment with regard to

ornithology. Whilst data on wintering birds is unavailable for the months of September and October in 2019 this is not considered to be a limitation given that the usual peaks in bird numbers usually occur later in the non-breeding winter period, often in January (see for instance data in Crowe and Boland, 2004; Boland et al., 2009; Crowe et al., 2016; Lewis et al., 2016).

1.9.6 Methodology for Desktop Surveys

A desk-study has been undertaken to inform the assessment presented within this chapter. This has included a systematic gathering and review of grey and peer-reviewed literature that included *inter alia*:

- NPWS website (National Parks and Wildlife Service, 2021) for information on protected sites;
- National Biodiversity Data Centre website (National Biodiversity Data Centre, 2021) for information on protected species;
- Birds of Conservation Concern in Ireland 2014 – 2019 (Colhoun and Cummings (2013);
- European Seabirds at Sea (ESAS) database (maintained by the JNCC, also covering marine mammals);
- Inland Fisheries Ireland: Water Framework Directive Fish Stock Survey of Rivers and Transitional Waters in the South Western River Basin District;
- Publications by Bord Iascaigh Mhara (Irish Sea Fisheries Board);
- Marine Institute fisheries surveys and data, including shellfish;
- Sea-Fisheries Protection Authority: Data and statistics from the Irish sea-fisheries industry, including landing numbers and quotas;
- International Council for the Exploration of the Seas (ICES) Fisheries Overview: Celtic Seas Ecoregion;
- ICES fisheries catch and survey data;
- FAO Fishery and Aquaculture Statistics;
- Eastern Regional Fisheries Board: fisheries reports;
- All Ireland Cetacean Sighting and Stranding Scheme (implemented by the Ireland Whale and Dolphin Group);
- Small Cetaceans in European Atlantic Waters and the North Sea (SCANS) (coordinated by Sea Mammal Research Unit of University of St Andrews);
- Irish Basking Shark Study Group Sightings (implemented by the Irish Basking Shark Study Group); and
- NPWS Seal database (coordinated by NPWS).

1.9.7 Designated Sites

In Irish Waters, designated sites associated with coastal (below Mean High Water Mark (MHWM)) and marine environments comprise Special Areas of Conservation (SACs; and candidate SACs), and Special Protection Areas (SPAs). These have been identified within 5km of the Proposed Development for habitat features and within species-specific search areas associated with different mobile features. These search areas for mobile features were as follows:

- Homing migratory fish show considerable spatial mixing around the coast as they return to their natal waters to spawn and the Proposed Development has the potential to affect both local and more distant migratory fish populations. The Proposed Development has considered principal migratory fish rivers both within the locale and to the east of the Proposed Development up to c.125km, the principal direction of migratory fish movements;
- SPAs that are designated in full or in part by supporting seabird species that could interact with the Proposed Development were identified using the mean max foraging ranges published in Woodward et al. 2019;

- For seal species, search areas were focused on foraging ranges, using typical distances of 120km for common seal, and 145km for grey seal (SMRU, 2011 and Thompson et al 1996, respectively); and
- For cetaceans, consideration was given to Marine Mammal Management Units (MU), primarily defined as being used in UK waters, but which also cover the Irish marine environment. MUs were established by the JNCC (JNCC, 2015), with the aim of enabling identification of plans and projects, which should be considered in impact assessments for key cetacean species within and adjacent to UK waters. MUs are established for individual species, then broken down geographically. For example, for harbour porpoise, the relevant MU is CIS, or Celtic and Irish Seas, and for bottlenose dolphin, two MU are applicable: Offshore Channel, Celtic Sea & South West England, and Irish Sea.

2 Screening for appropriate assessment and in-combination assessment

2.1 Relationship of the Proposed Development to the conservation management of European sites

Step 1 seeks to determine whether or not a plan or project is directly connected to or necessary for the management of a European site (s).

The European Commission Guidance (2018) states that, in order to conclude that a plan or project is directly connected or necessary for the management of a European site, it must relate solely to conservation actions and not be a direct or indirect consequence of other actions.

In this instance, the Proposed Development is not connected to, or necessary for, the management of any European site.

2.2 Description of the receiving environment

2.2.1 Intertidal and Benthic Habitats

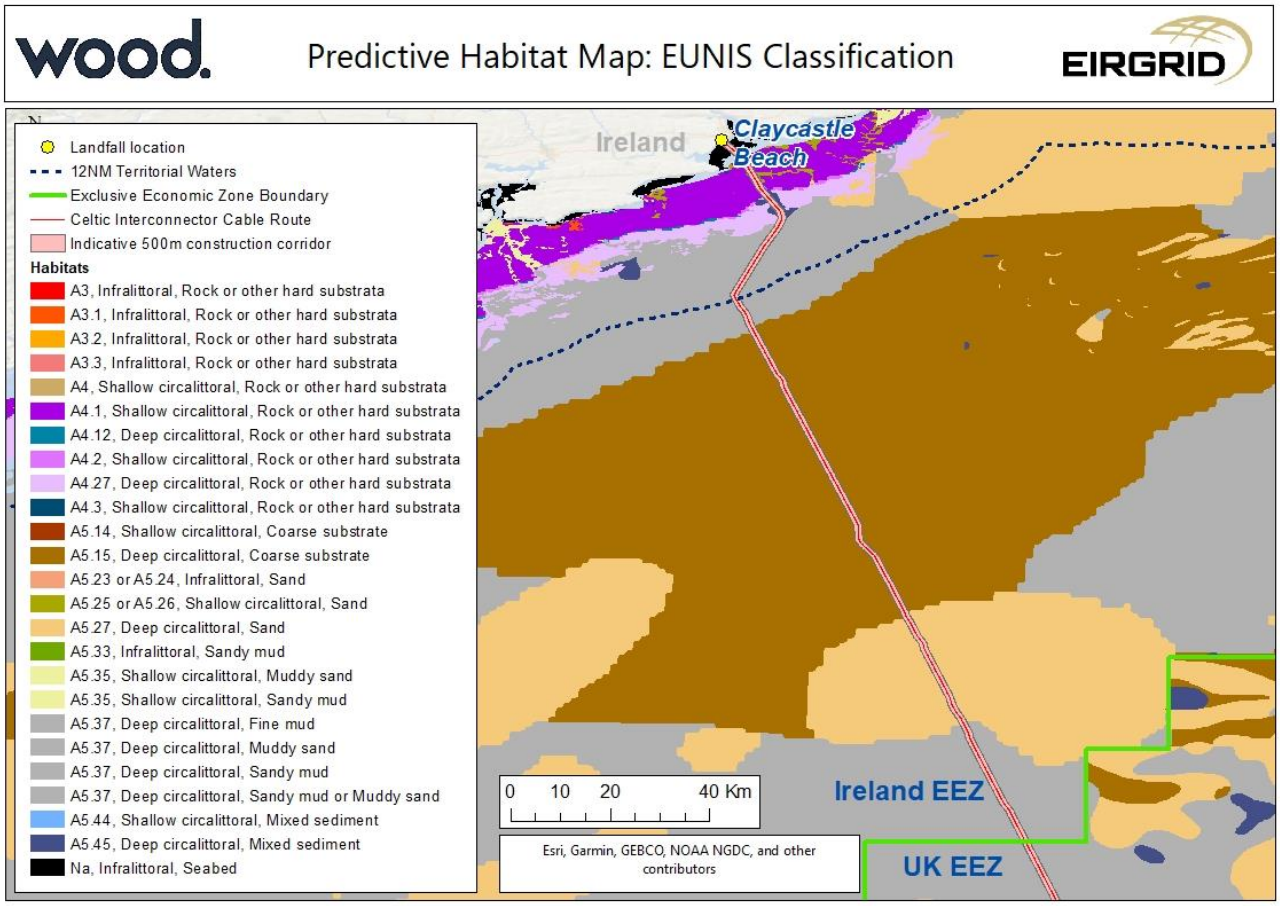
Next Geosolutions undertook benthic surveys in Irish waters in Autumn 2017 (as well as in UK and French waters) (Next Geosolutions, 2018). These surveys mapped the distribution and extent of marine benthic habitats from interpretation of the geophysical survey data for the cable route and landfalls; in particular, the presence of potential Annex I habitat communities. Baseline data was then gathered for all habitat types recorded within close proximity to the proposed, assisted by seabed photography and benthic sampling to ground-truth all key seabed habitats. This identified a range of habitats along the cable corridor, as presented in Figure 2.1 and Table 2.1. No designated Annex I habitat was identified.

Table 2.1: Summary of habitats along the route of the Celtic Interconnector (project survey data)

EUNIS Code	Biozone	Substrate	Length present along cable route (km)
A5.15	Deep circalittoral	Coarse substrate	61.1
A5.37	Deep circalittoral	Fine mud	24.9
A5.45	Deep circalittoral	Mixed sediment	5.5
A5.44	Shallow circalittoral	Mixed sediment	1.1
A5.37	Deep circalittoral	Muddy sand	22.3
A4.27	Deep circalittoral	Rock or other hard substrata	1.1
A5.27	Deep circalittoral	Sand	22.7
A5.25 / A5.26	Shallow circalittoral	Sand	6.8
A5.37	Deep circalittoral	Sandy mud	1.4
N/A	Infralittoral	Seabed	1.9
N/A	Shallow circalittoral	Seabed	1.9

The distribution of these, and other habitats in the wider vicinity of the Proposed Development, drawing on the above survey data, is shown Figure 2.1.

Figure 2.1 Predictive Habitat Map of EUNIS Classifications



The sediment type observed during survey within the Irish Territorial Waters and Irish EEZ showed substrate was variable, ranging from areas of soft rippled sand to large rocks and cobbles. Epifauna was also relatively variable reflecting substrate type with reasonably low abundance in the sandy regions, increasing in areas of cobbles and boulders where a hard substrate was present for encrusting fauna.

The habitats identified through detailed surveys of the cable route are associated with a number of intertidal and subtidal communities.

Along the cable route on the approach to Claycastle Beach, the benthic community is characterised by the presence of species groups including cnidaria, nemertea, annelida, arthorpoda, mollusca, phoronida, and echinodermata. These form important elements of complex marine and coastal foodwebs, providing prey species for fish populations, and subsequently birds and marine mammals. One area of medium-stony reefiness was identified on the approach to Claycastle Beach; and such reefs can form key habitats for other species and may develop in importance over time. Surveys within the Proposed Development footprint and wider ZoI did not identify any other environmental sensitive habitats or benthic communities, or the presence of any confirmed areas of Annex I habitats, as listed under the EC Habitats Directive (such as biogenic reefs, or subtidal pockmark features).

Surveys completed in 2020 indicated the intertidal region is formed from sandy sediments. Further offshore the sandy sediments form a channel which is bordered by rocky outcrops. The depth of the sediment is greater than 3m.

The intertidal region is approximately 200m long with a sloping gradient of approximately 4 degrees. Beyond the intertidal zone the seabed profile is relatively flat with gentle gradients leading to an uninterrupted smooth progression to the 10m water depth at approximately Kilometre Point 2.9. both erosion and deposition occur on this beach. Evidence for this lies with attempts in the past to control longshore drift by building groynes and

dumping rock. A sediment transfer study was undertaken for the Claycastle landfall in 2018. The report indicated that changes in the seabed levels are driven by wave driven currents. The seabed at Claycastle is considered relatively stable.

In 2019, a thorough desktop survey was undertaken (Aquafact, 2019) of five potential Irish landfall sites being considered at that stage (Inch Beach, Ballycroneen, Ballinwilling Strand, Redbarn Beach and Claycastle Beach). Habitats were classified based on the European EUNIS classification, combining the general environment, nature of sub-strata, littoral zonation, and flora/fauna species present at the site being assessed.

The broad categories, and associated sub-categories of habitat, recorded at Claycastle Beach were as follows:

- A1.2 – Moderate energy littoral rock:
    - A1.212: *Fucus spiralis* on full salinity exposed to moderately exposed upper eulittoral rock. This sub-habitat was identified on the existing pipe outfall at Claycastle Beach, with species present including limpets, winkles and barnacles. Ephemeral green seaweed is often common during summer months and was recorded during the bespoke field surveys for the Proposed Development.
- A1.4 – Feature of littoral rock for example, ephemeral algae in the intertidal zone:
    - A1.45: Ephemeral green or red seaweeds (freshwater of sand-influenced) on non-mobile substrata. Although ephemeral green seaweeds were recorded at Claycastle Beach, the littoral rockpool communities which can be a feature of the habitat were mainly absent.
- A2.2 – Littoral sand and muddy sand: In general, across all sand sub-habitats, limited shell debris was recorded on the sediment surface, with slight rippled patterns as a result of wave action and tidal currents. Species present included communities of amphipods and polychaetes, as well as some barren areas at Claycastle Beach. Sand mason worms were recorded in the lower littoral zones.
    - A2.22: Barren or amphipod-dominated mobile sand shores.
    - A2.23: Polychaete / amphipod-dominated fine sand shores.
    - A2.245: *Lanice conchilega* in littoral sand.
- A2.4 – Littoral mixed sediment: Areas of A2.43 were observed beneath the drift line at Claycastle Beach, with areas of A2.431 in the midlittoral zone. The underlying substratum for both comprised rock and boulders, with coarse sand also present.
    - A2.43: Species-poor mixed sediment shores.
    - A2.431: Barnacles and *Littorina* spp. on unstable eulittoral rock.
- B1 – Coastal dunes and sandy shores:
    - B1.2: Sand beaches above the driftline. This was recorded at Claycastle Beach, above the high water mark, formed as a result of sands brought up the beach by wave and wind action.
- B2 – Coastal shingle:
    - B2.1: Shingle beach driftlines.

In addition, clay outcrops were observed at all three intertidal locations surveyed, with fossilised wood at two sites and peat outcrops at one.

Following the identification of the preferred landfall site at Claycastle Beach, marine sediment, intertidal and subtidal benthic studies were conducted in January 2020, within c. 2km of the landfall (Aquafact, 2020).

Designated Sites

The Proposed Development does not overlap or adjoin any designated sites. Having regard for the potential value of national sites to provide ex-situ habitat for mobile European site features, Table 2.2 identifies all designated sites within environs of the proposed cable route and working areas, including European sites,

statutory designated national sites (Nature Reserves), and non-statutory designated national sites (proposed Natural Heritage Areas). A full screening for European Sites is provided in Section 2.7, which considers all relevant European sites, regardless of jurisdiction, based on Zone of Influence.

Table 2.2 Designated sites within environs of the Celtic Interconnector, including pNHAs having regard for potential ex-situ value to European sites. To be read with full screening of sites in

Site Name/Code	Distance from Proposed Development (km)	Summary of designated features
Ballyvergan Marsh pNHA - 000078	c. 0.2 km	Wetland habitats, wintering raptors, breeding and non-breeding birds, otter
Ballymacoda (Clonpriest and Pillmore) SAC – 000077/pNHA	2.7 km	Coastal habitats
Ballymacoda Bay SPA - 004023	1.3 km	Wintering waterbird assemblage
Blackwater River (Cork/Waterford) SAC - 002170	1.4	Coastal and riparian habitats, migratory fish, freshwater invertebrates and plants, otter
Blackwater River and Estuary pNHA - 000072	1.4	Coastal and riparian habitats – overlaps with Blackwater River SAC
Capel Island and Knockadoon Head Nature Reserve and pNHA– 000083	2	Coastal headland and island
Blackwater Estuary SPA - 004028	2.6	Wintering waterbird assemblage
River Barrow and River Nore SAC - 002162	6.5	Coastal and riparian habitats, migratory fish, freshwater invertebrates and plants, otter
Ardmore Head SAC - 002123	8.3	Sea cliffs and heaths

The Proposed Development solely overlaps and adjoins non-designated habitats which nevertheless provide confirmed or potential ex-situ habitat to mobile European species, These include:

- Marine mammals (including grey seal *Halichoerus grypus*, harbour porpoise *Phocoena phocoena* and bottlenose dolphins *Tursiops truncatus*);
- Seabirds (including fulmar *Fulmarus glacialis*, gannet *Morus bassanus*, storm petrel *Hydrobates pelagicus*, gull species);
- Fish species (including migratory fish species such as Atlantic salmon *Salmo salar*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, and twaite shad *Alosa fallax* which utilise marine and freshwater habitats; and
- Coastal birds (including waders such as curlew *Numenius arquata*, sanderling *Calidris alba*, ringed plover *Charadrius hiaticula*).

Full consideration of mobile species and the potential for impacts on designated sites and species which are remote to the Proposed Development is provided in Section 2.7.

2.3 Description of the Proposed Development – Cable landfall

Claycastle Beach, south of Youghal, Co. Cork, was selected as the Best Performing Option (BPO) of the identified Irish landfall options (see Chapter 7 – Consideration of Alternatives). The overall landfall area comprises the beach area, a car park situated above the beach, and a grassed area adjacent to the car park. For clarity, this section describes the overall landfall area; however, the Proposed Development for the purposes of this EIAR extends to the OSI 25" mapping historic High Water Mark.

Two high voltage direct current (HVDC) subsea cables and a fibre optic link with associated power supply will be buried within pre-installed Steel / High Density Polyethylene (HDPE) conduits beneath the beach and car park at Claycastle Beach. The HVDC cables extend across the HWM and enter the two underground concrete chambers of a Transition Joint Bay (TJB); this chamber is where the subsea cables will connect with the onshore cables. In addition, A communications chamber will house the joint between the submarine communications / fibre optic link and the terrestrial communications / fibre optic link. The TJB, the onshore cable and fibre optic link are elements of a separate application to An Bord Pleanála for Approval of proposed Strategic Infrastructure Development (SID).

In order to minimise potential disruption to the beach area and to ensure that the main construction activities occur outside the bathing season, it is proposed to construct the landfall in two phases. Phase One involves the pre-installation of the conduits while Phase Two involves the pull-in and burial of the cables.

The final specific details of the landfall construction shall be determined in the detailed design phase, but shall be within the parameters assessed in this EIAR. Two options for construction of that portion of the landfall area on the Foreshore (i.e. immediately below the TJB) are proposed, both of which are assessed within the EIAR:

- Option 1 (Figure 2.2) is to install the conduits from the TJB across the car park and below the beach almost to the Lowest Astronomical Tide (LAT) level. This will minimise disruption to the beach during the bathing season; however, this increases the construction effort in Phase One, as it requires the provision of a causeway to facilitate construction and the laying of the conduits, and a cofferdam to prevent seawater ingress during construction.
- Option 2 (Figure 2.3) is to install the conduits from the TJB across the car park and below the beach, but extending only a short distance below the beach, thus significantly reducing the construction effort. In particular there would be no requirement for a causeway and the extent of cofferdam piling would be minimal, thus reducing associated noise and traffic. However, it would result in the requirement for a short duration (estimated at approximately 7 days) localised exclusion zone (of approximately 50m), with associated pedestrian diversion off the beach and across the car park during the cable installation.

As Option 1 above represents the worst case scenario from an EIAR perspective, and Option 2 does not introduce new or additional concerns, the impact of Option 1 is addressed in this assessment. Where Option 2 presents a significant difference or is out of line with the scope of assessment of Option 1 it is described and assessed as appropriate, within the relevant technical chapter.

Figure 2.2 Phase One landfall construction for Option 1

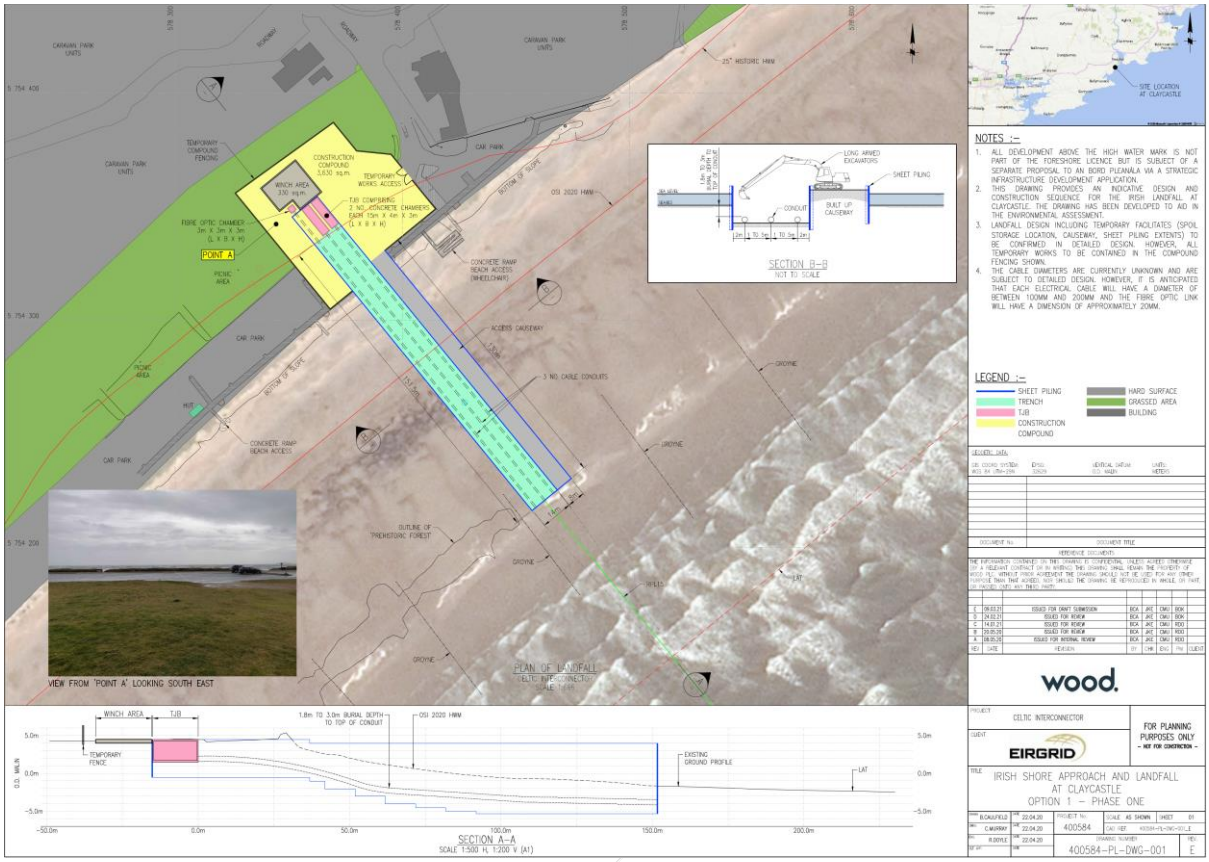


Figure 2.3 Phase One landfall construction for Option 2

Cable Conduits

Three cable conduits are proposed for both Option 1 and Option 2, one for each cable (two HVDC cables and fibre optic link, with an integrated power supply cable). There may also be a requirement for the installation of spare conduit (s). The conduits will be constructed of carbon steel, and designed with a specific gravity of approximately 1.4 - 1.6 to ensure against liquefaction. The size of the proposed conduit has an internal diameter of 300mm. Alternative conduit material such as HDPE may be used. It should be noted that HDPE is buoyant when flooded and will require the installation of concrete collars to ensure ballast even when trenched in the nearshore (see Figure 2.4).

The three conduits will be installed at a 5m spacing between centres and will extend from the TJB (which will be located above the HWM in the grassed area adjacent to the beach car park) to approximately 150m into the intertidal zone in Option 1 and to the top of the beach in Option 2.

In Option 1 the conduit cable entry point is located within the intertidal zone, approximately 50m shoreside of LAT. The advantages of locating the conduit cable entry point above LAT is that it will enable land-based installation equipment to be used. This removes the requirement for an extended cofferdam / causeway at the landfall and the use of a pre-lay dredging spread beyond LAT.

The burial depth to top of conduit varies from 3.0m onshore to 1.8m offshore at the conduit entry point.

Figure 2.4 Steel (Left) and HDPE (Right) Conduits

Landfall Installation Construction Works

The cable landfall installation method selected for Claycastle Beach is an open cut installation method to be constructed in two phases. Horizontal Directional Drilling (HDD) is not feasible due to the distance to the 5m water depth required for the offshore supporting vessel and the gentle sloping nature of the beach and nearshore.

Phase One Installation

The first phase of the installation for both Option 1 and Option 2 involves the installation of pre-installed conduits within a trench excavated across the beach and extending across an existing car park located above the beach to the area of the TJB.

Within the beach area, the trench will be excavated using land-based equipment such as long arm excavators. Option 1 will require the aid of a temporary sheet piled cofferdam to ensure trench stability and an adjacent temporary causeway for access. The trench will be backfilled, and site reinstated to its original condition following phase one installation (approximately 10 weeks).

For Option 1, temporary sheet piling (cofferdam) and the installation of a temporary causeway will be required to achieve the required DOL for the cable installation and prevent the ingress of sediments. The steel sheet-piles will be installed using a piling rig comprising hydraulic vibratory hammers. The piling rig will typically work from the beach outward, using the formed temporary causeway as an access route.

The cofferdam will be approximately 130m long and formed from two lines of sheet piles installed parallel to the centreline of the conduits. The cofferdam will also be enclosed by sheet piles at its offshore end. With the conduits installed at approximately 5m spacing between centres, an approximately 14m wide cofferdam is conservatively assumed to be sufficient. The cofferdam will be installed from a temporary causeway constructed adjacent to the cofferdam.

The temporary causeway will also be enclosed by sheet piles on all shore facing sides to mitigate against the ingress of seawater and sediments particularly at high tides. The causeway will be of sufficient width to allow heavy land-based equipment to manoeuvre during trench excavation and conduit installation. An approximately 8m wide causeway (est. 6000m^3) is therefore proposed. The temporary causeway shall be constructed from aggregate material to provide sufficient strength to support excavating equipment. The temporary causeway will be constructed, utilized and removed during the 10 week period of phase one.

Option 2 will not require a causeway and the extent of cofferdam will be minimal (approx. 5m).

The proposed offshore trench, cofferdam and temporary causeway for Option 1 are presented in Figure 2.5 and Figure 2.6.

Figure 2.5 Temporary Works – Trench, Cofferdam, Causeway (typ. N.T.S)

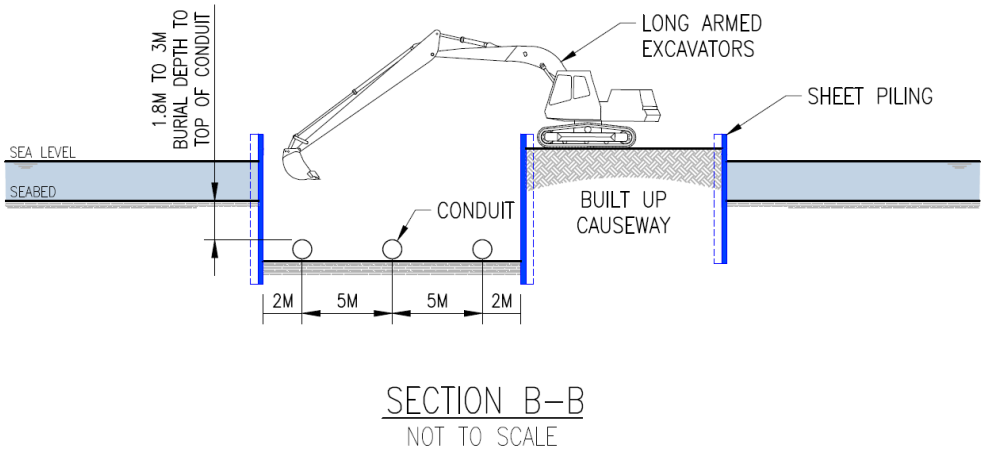


Figure 2.6 Temporary Works – Cofferdam and Causeway Construction

Following installation of the temporary cofferdam for Option 1, the trench shall be excavated using long armed excavators from the causeway. The trench depth tapers from 3m at the onshore connection point to the TJB, to 1.8m in the intertidal area. Figure 2.7 provides a sketch of this phase of installation. Spoil material from the trench (est. 4000m^3) shall be stored within a temporary construction compound, to be located onshore on hard standing. Storage and re-use of spoil will allow the site to be restored to its previous condition following the installation of the conduits. Stored spoil shall be adequately covered to prevent exposure to the elements.

Following completion of the trench for both Options, the conduits shall be transported from a staging area located in the hard standing car park within the construction compound and will be laid above ground in the trench on top of support structures such as sandbags, trestles, and plinths. Conduit pipe segments (3m-5m) shall be strung together by welding to form the conduit pipe string and transferred shoreward using lifting machinery as shown in Figure 2.8.

Figure 2.7 Temporary Works – Trench Excavation

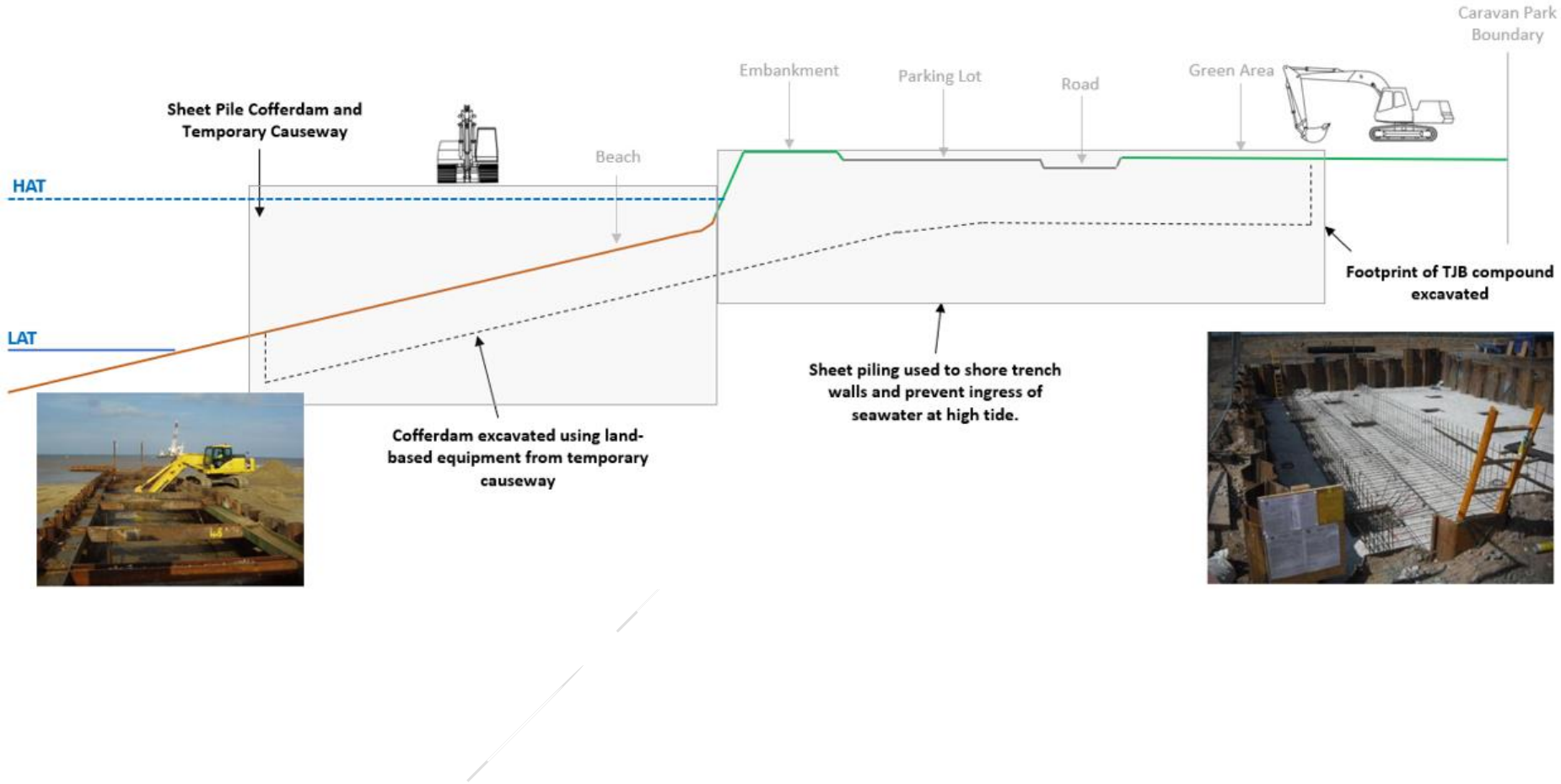
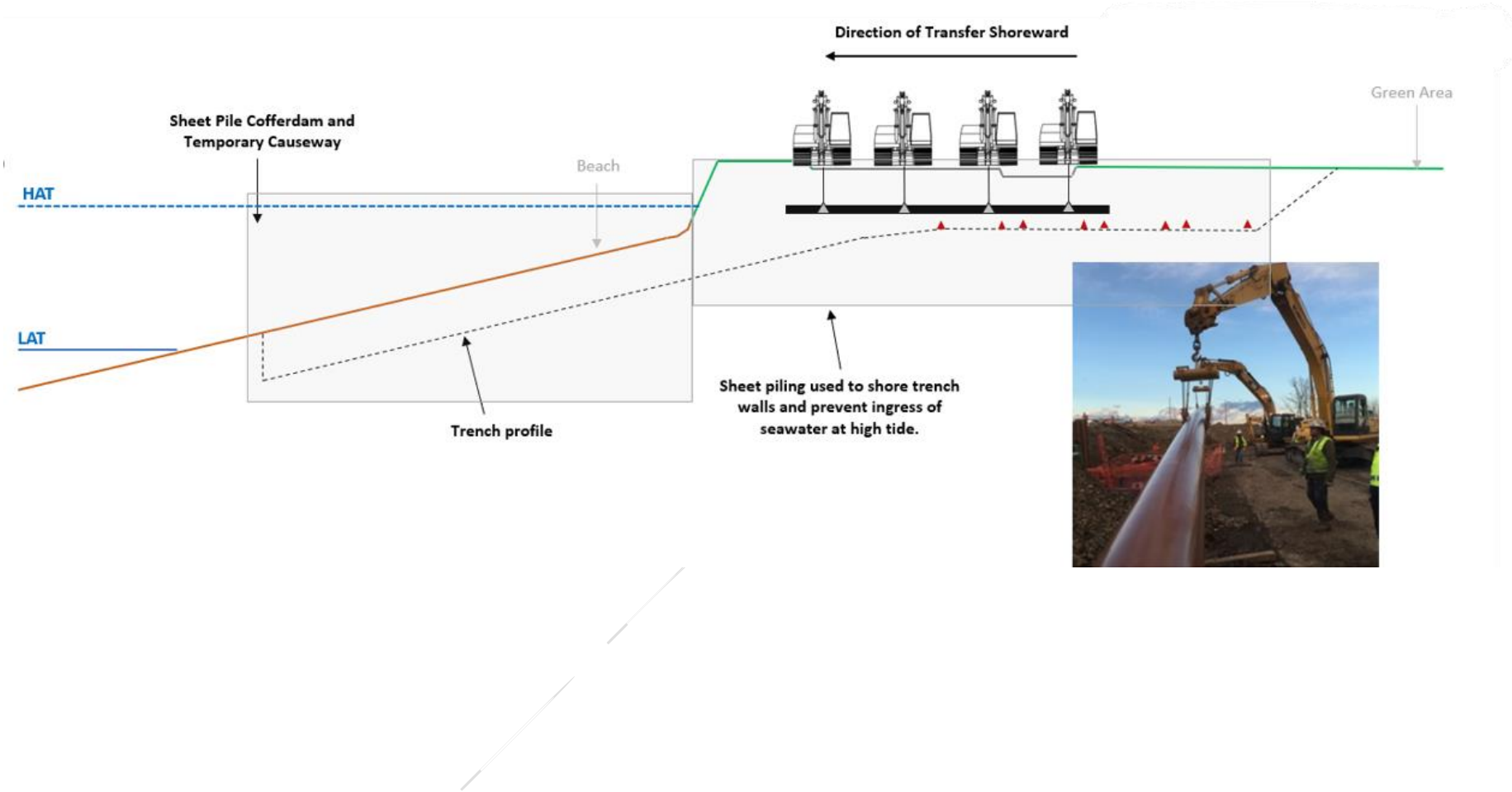


Figure 2.8 Temporary Works – Conduit installation

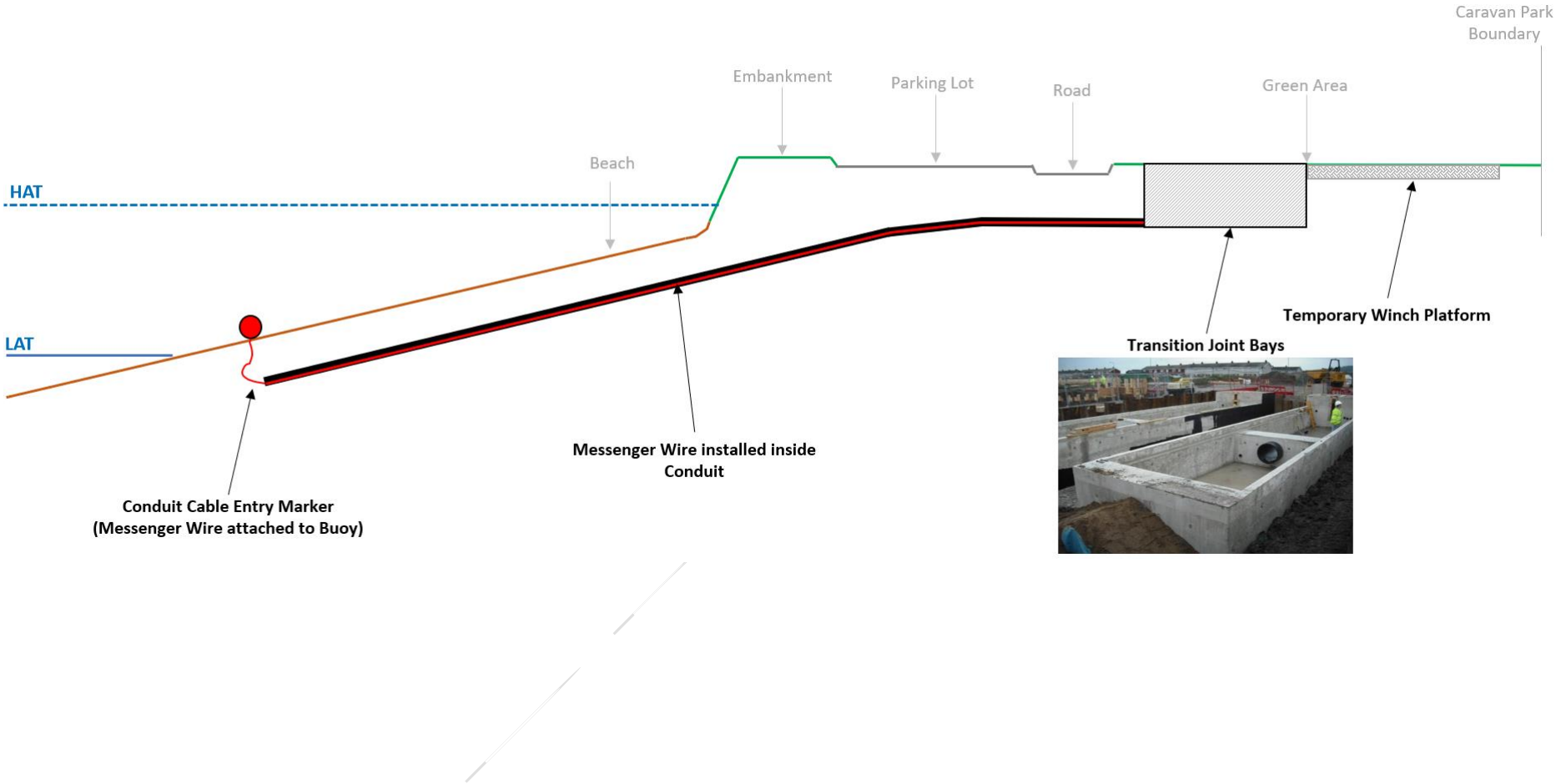


Following the installation of the conduits any temporary conduit supports within the trench will be removed and a messenger wire will be pre-installed within the conduits. The trench spoil will be returned to the trench to re-instate the beach to its prior condition. The temporary causeway and cofferdam will be removed and the car park will be re-instated.

A temporary winch platform of approximately 20m-by-20m area will be required for Phase Two. The platform, which will be of hard standing, typically compacted aggregate, will be established on the shore side of the TJB, above the HWM, in order to pull the cables through the conduits and into the TJB. The platform will be constructed during Phase One to minimise disruption to third parties in Phase Two. The temporary winch platform is separately proposed in the SID application to An Bord Pleanála for Approval of the Ireland Onshore element of the overall Celtic Interconnector project.

Figure 2.9 shows the installation layout at the end of Phase One with the beach restored to its prior condition and the temporary winch platform and conduit end pipe marker the only visible installation elements.

Figure 2.9 Phase One Post-Construction



Phase Two Installation

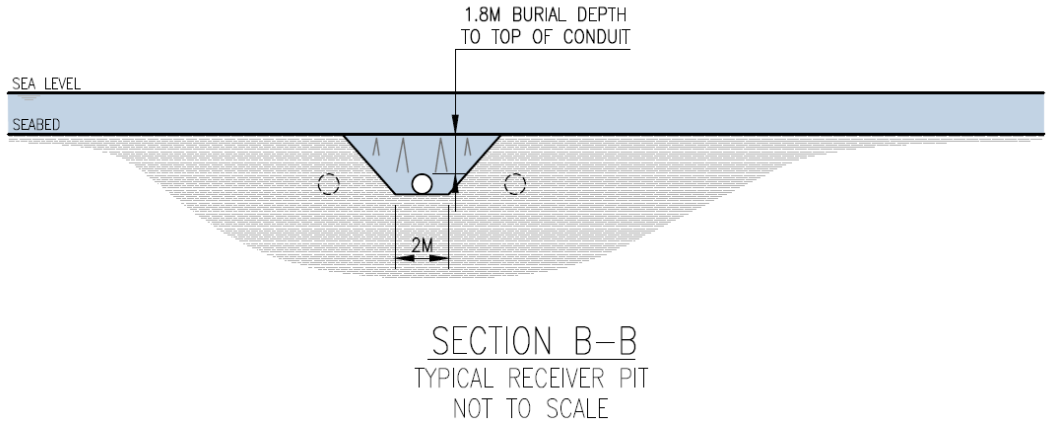
The second phase of the installation sequence involves pull-in of the offshore cables through the pre-installed conduits and into the TJB using a cable winch spread. The location of the receiver pit will vary between Option 1 and Option 2, however, all other activities are similar. Option 2 requires exclusion of the public from a 50m corridor of the beach for 2-3 days for the installation of each cable; however, the car park would remain fully accessible and allow for localised and temporary diversion around the exclusion zone.

The receiver pit for each of the cable conduit entry points will be a tapered trench approximately 10m long. The trench will start from the end of the conduit and extend towards LAT where it will taper up to the seabed. This receiver pit is required to retrieve the pre-installed messenger wire from the end of the conduit and to provide a smooth transition from the seabed down to the conduits during cable pull-in.

The receiver pit will be excavated using land-based equipment at low tide to minimise sediment dispersal within the water column. It is envisaged that each receiver pit will be excavated separately just prior to the associated cable pull-in operation and backfilled prior to excavation of the next receiver pit for the next cable pull-in.

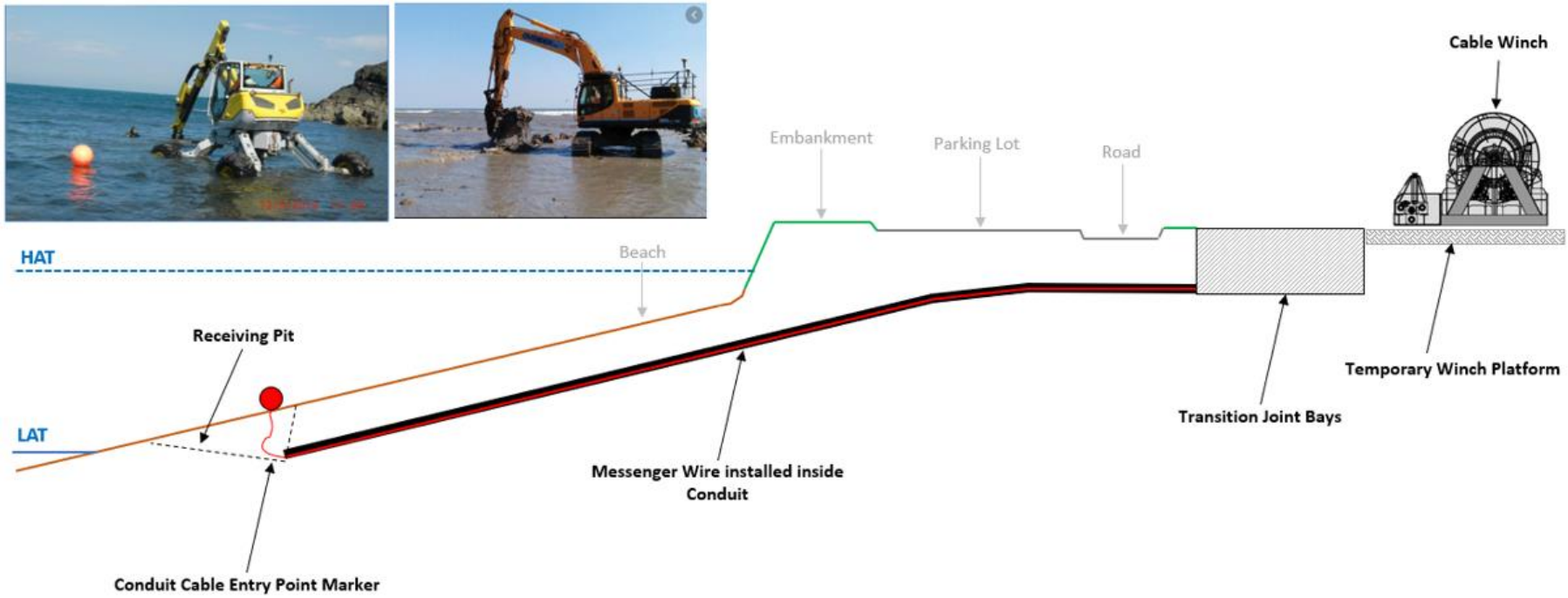
The typical receiver pit that is proposed for each of the cable conduit entry points is illustrated in Figure 2.10.

Figure 2.10 Temporary Works – Cable Conduit Entry Excavation



A cable winch shall be installed on the temporary platform located behind the TJB above the HWM as set out above. The onshore end of the messenger wire shall be retrieved from the TJB and connected to the cable winch wire. Figure 2.11 shows the arrangement once the cable winch has been installed.

Figure 2.11 Temporary Works – Cable Winch installed



The submarine cables shall arrive on site aboard a cable lay vessel. The messenger wire shall be transferred to the cable lay vessel for connection to the end of the submarine cable as shown in Figure 2.12.

The submarine cable is then floated / pulled onto shore with the aid of temporary buoyancy aids which are removed prior to pull into the conduit. The temporary buoyancy aids are retrieved by the cable lay vessel as shown in Figure 2.13. The winch is used to pull the cable ends up to the TJB.

Once the cable is secured in the TJB, the offshore cable lay and burial process shall commence. For this, a plough / jetter shall be transferred to the beach to bury the cable seaward. Following departure of the cable lay equipment, the receiving pit shall be filled in and the beach restored to its prior condition as shown in Figure 2.14.

Figure 2.12 Messenger Wire Transfer to Cable Lay vessel

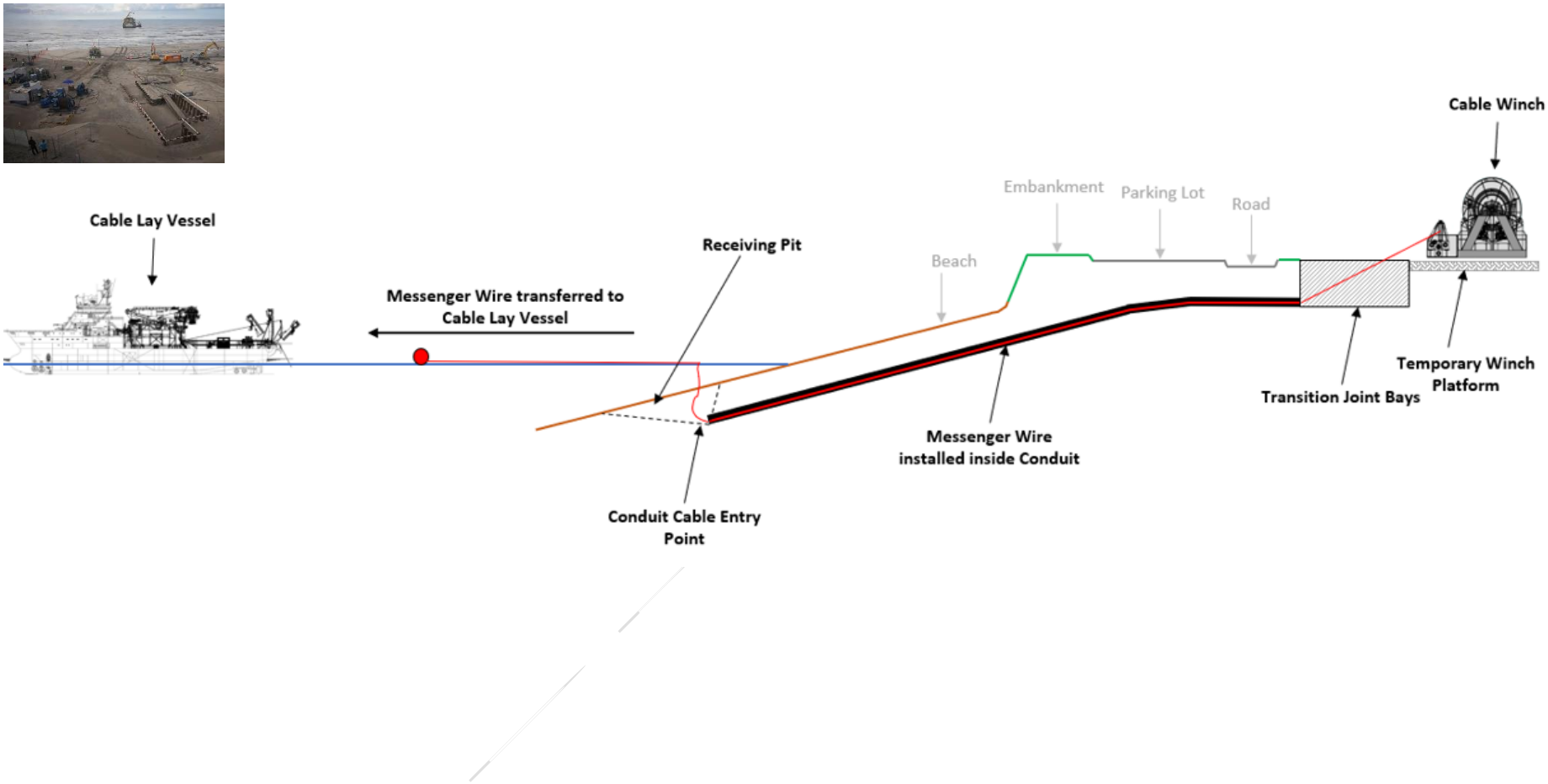


Figure 2.13 Submarine Cable floated to Shore

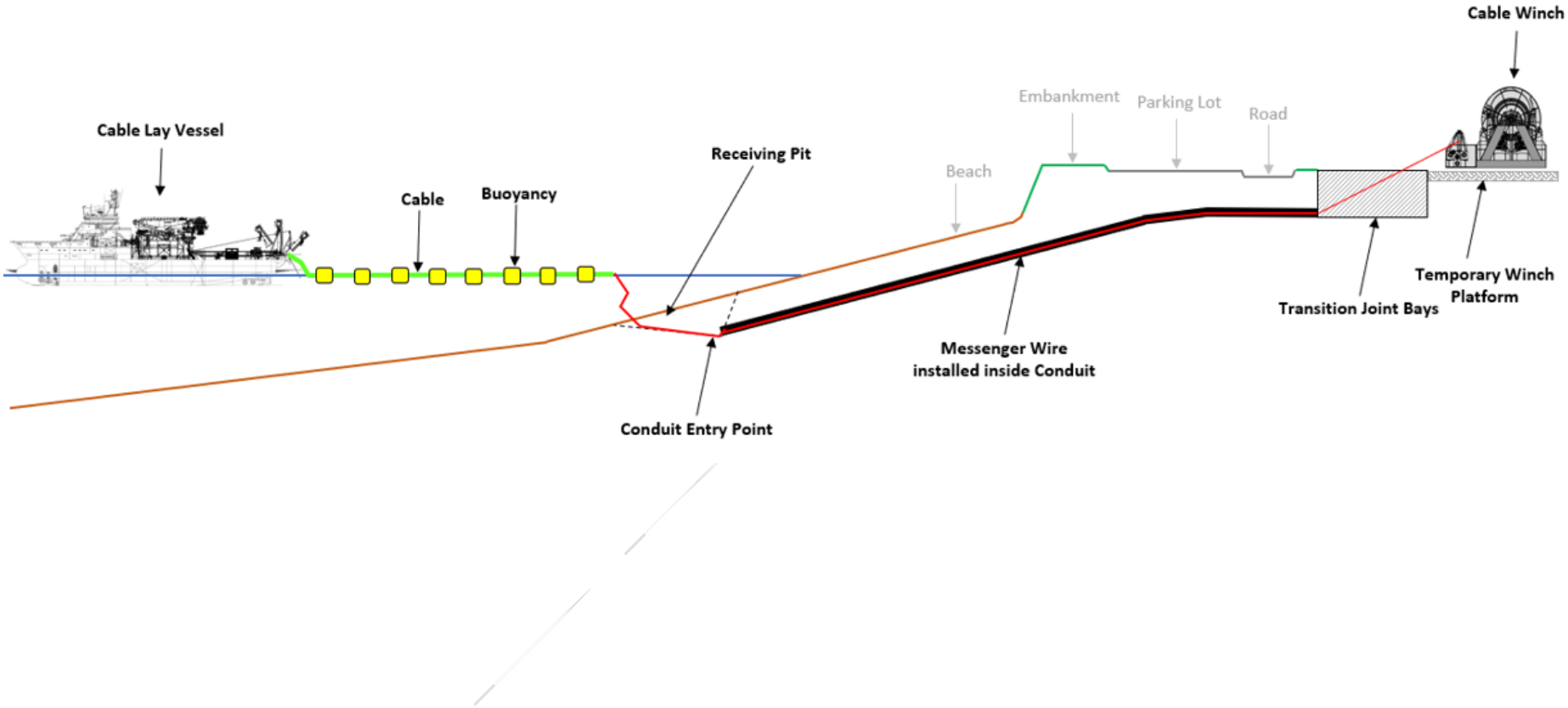
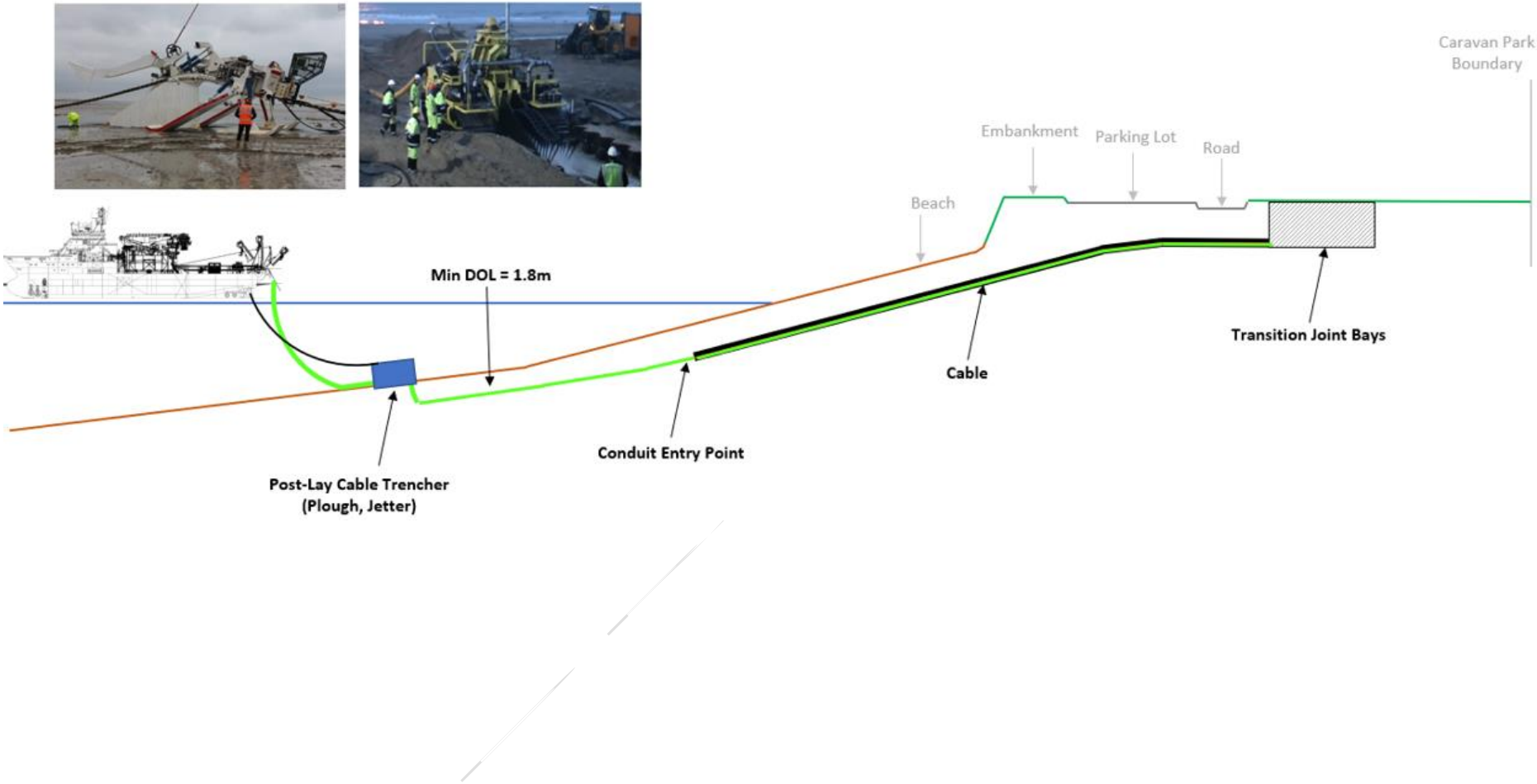


Figure 2.14 Phase Two Post-Construction



Temporary Construction / Laydown Areas

Phase One Construction

Land take of approximately 3,360m^2 is required along the beach, the car park, and the section of grass above the HWM which separates the car park from the year-round holiday park for Phase One as shown in Figure 2.15. This area will be used for installation of the onshore trench (for both Option 1 and Option 2), the TJB and the winch platform.

Access shall be through a temporary gate located at the car park entrance utilizing the current access road. All installation workers will be directed to use the designated access/egress routes only.

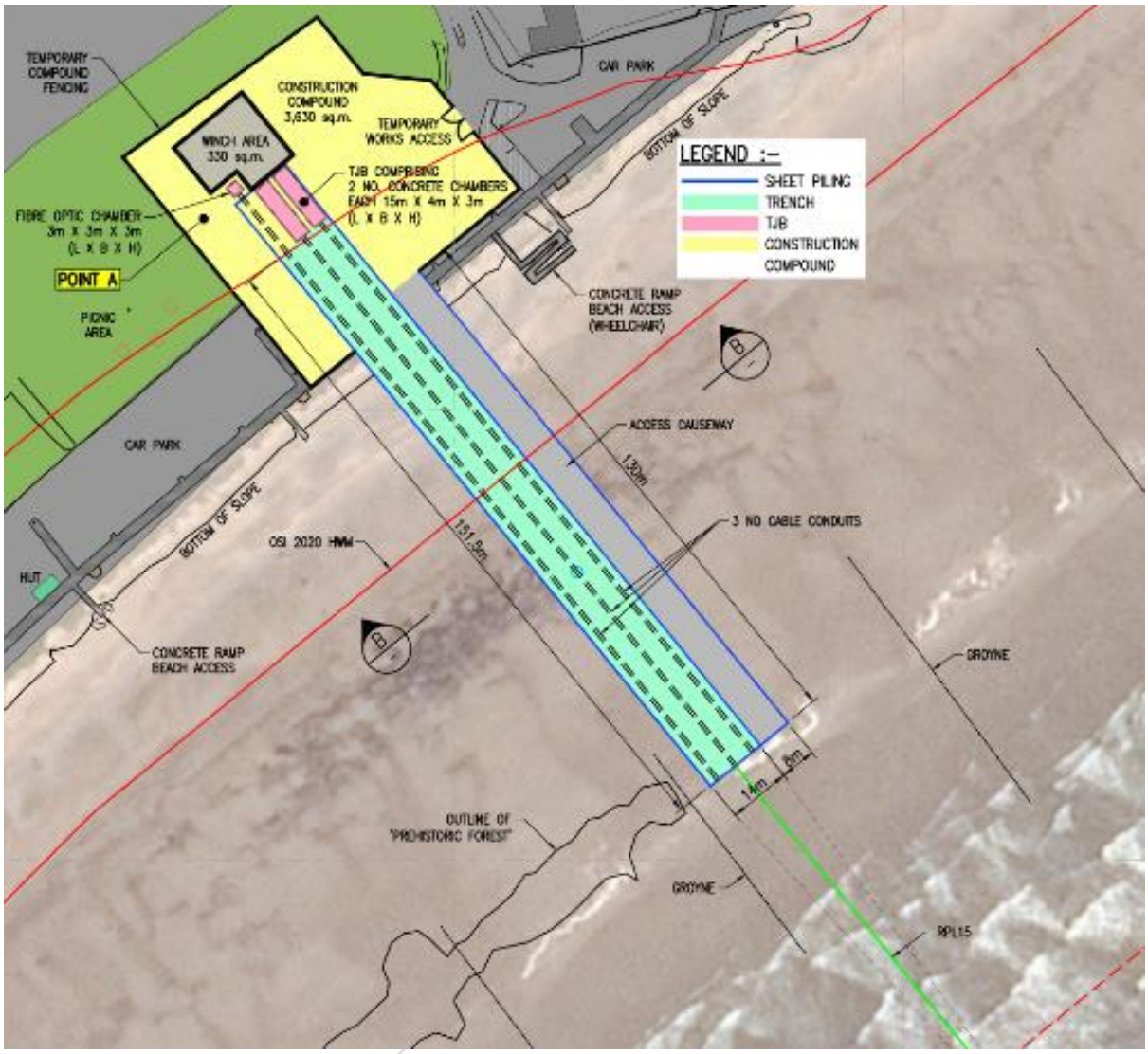
Temporary facilities will be provided which will include installation phase car parking, welfare facilities and laydown areas as necessary. The hard standing car park area will be used as a staging area for all installation activities. Any discharges from temporary welfare facilities will be connected to a sealed holding tank to be emptied and disposed of off-site by a licensed contractor to a licenced facility, operating within its design capacity.

Storage of fuel and refuelling will be within bunded hardstanding areas. Water will be brought to site via tankers as required.

Land take of approximately 2,860m^2 is also required into the intertidal zone for installation of the sheet pile cofferdam and temporary causeway for Option 1. The land take in the intertidal zone for Option 2 would be approximately 200m^2.

Construction and laydown areas for Phase One installation are shown in Figure 2.15.

Figure 2.15 Construction/laydown Area Phase One (Option 1)

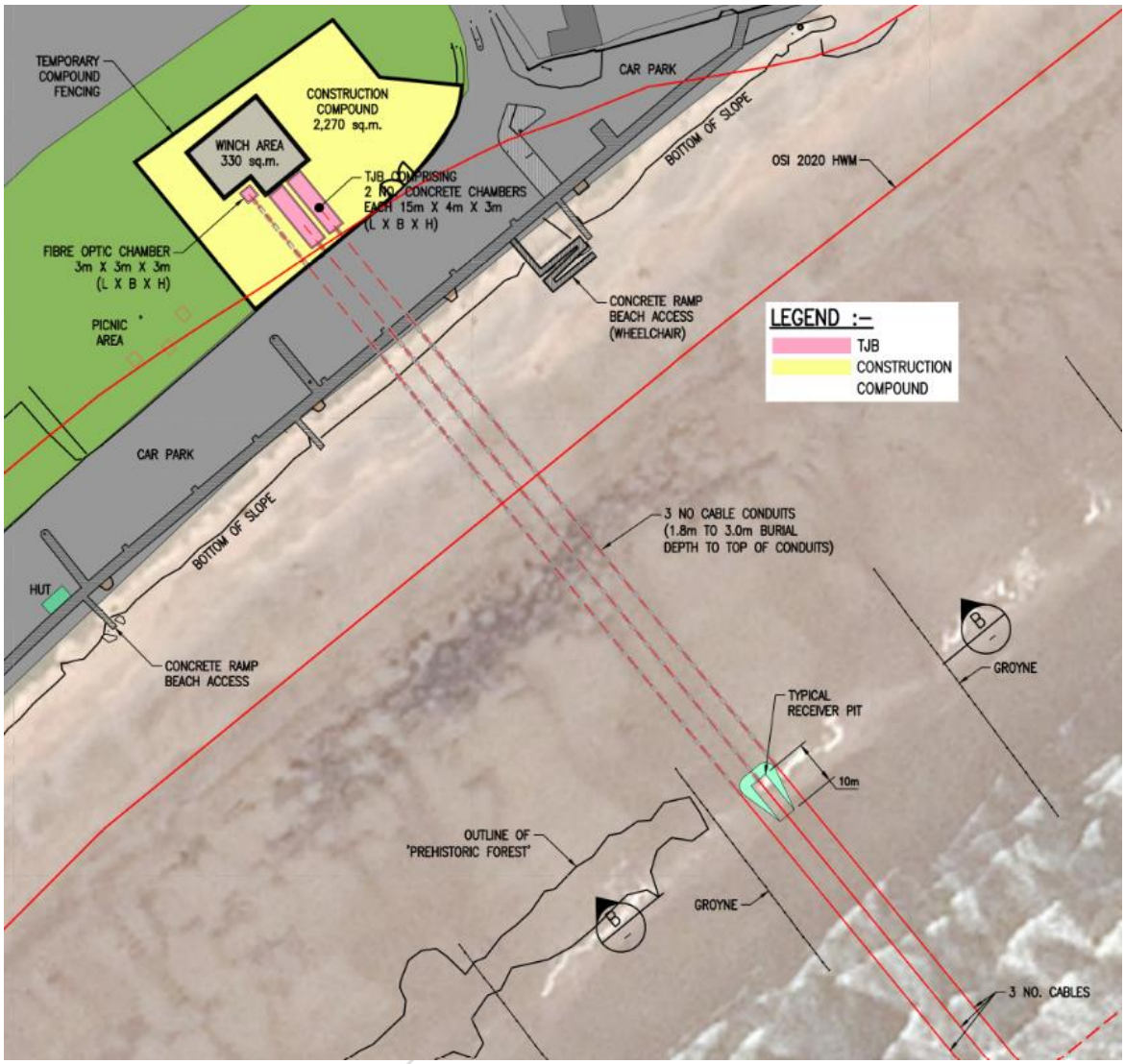


Phase Two Construction

In Phase Two, a land take of approximately 1,750m^2 (in addition to the construction compound described above) is required in the section of grass above the HWM that separates the car park from the year-round holiday park. This area will be used for the winch, its retaining system (back anchorage) and all associated equipment. Car park access to the general public shall not be disturbed at this time. Access to the site shall be through a temporary gate to the public car park.

In Option 1, limited land take is also required in the intertidal zone around each of the conduit cable entry points. This is required to retrieve the pre-installed messenger wire from the end of the conduit prior to cable pull-in. In Option 2, an exclusion corridor of approximately 50m will extend from the receiving pit at the top of the beach to the water line during cable installation. Access to the car park will remain allowing local and temporary diversions for those walking on the beach. Construction and laydown areas for Phase Two installation are shown in Figure 2.16.

Figure 2.16 Construction / Laydown Area Phase Two



Construction Traffic

Phase One

The construction of the cofferdam and causeway associated with Option 1 represents the worst case scenario for construction traffic and is therefore described below.

The installation vehicle movements for the transportation of steel for the cofferdam and aggregate material for the temporary causeway are estimated at 60 ingress / egress movements for the cofferdam and 1,300 ingress / egress movements for the temporary causeway. This is expected to take approximately 4 weeks in two phases; installation and removal.

Approximately 100 sections of steel conduits shall be transported to the installation site on flatbed lorries each being 3m-5m in length. This will require approximately 30 vehicle movements over a three-week period. Construction vehicular movements are planned to occur via the N25 and the local road to Claycastle Beach. The specific construction access route, in particular for larger vehicles, will be agreed between the appointed contractor and the Local Authority prior to commencement of main development at the Landfall Interface area.

The number of installation workers required during the installation phase is expected to peak at approximately 30 persons for the submarine cable landfall. Approximately 40 light vehicle movements per day will be required to transport these workers to and from the sites. Parking will be required for the duration of the works.

Following completion of the trench backfill the car park section which was removed for the trench shall be re-instated necessitating an additional 10 access / egress movements to supply tarmacadam.

Note: This does not include the installation of the TJB which is separately proposed in the SID application for Approval of the Ireland Onshore element of the overall Celtic Interconnector project.

Phase Two
The installation vehicle movements for the second phase are estimated at 100 ingress / egress movements which may include at least 2 abnormal load movements for the delivery and retrieval of the cable winch.

The number of installation workers required during the installation phase is expected to peak at approximately 10 persons for the submarine cable landfall. Approximately 10 light vehicle movements per day will be required to transport these workers to and from the sites. Parking will not be required within the compound for the duration of the works in order to maintain public access to the car park which shall also be used for construction workers parking.

Outline Construction Schedule and Timing of Works
Subject to the grant of statutory approvals, it is programmed that installation of the offshore route will commence in 2024, for it to become fully operational in 2027.

Phase One Installation
The first phase of the installation sequence will be focused outside the peak summer months, i.e. October 2024 to April 2025, to avoid conflicting with the tourism season at Claycastle Beach. The estimated duration for Option 1 Phase One is anticipated to take approximately 10 weeks and is detailed as follows:

- Mobilisation / Site Preparation – 1 week.
- Landfall Civil Works – 4 weeks.
- Conduit stringing and Installation – 3 weeks.
- Backfilling and Site Reinstatement – 2 weeks.

The estimated duration for Option 2 Phase One is anticipated to take approximately 6 weeks and is detailed as follows:

- Mobilisation / Site Preparation – 1 week.
- Landfall Civil Works – 2 weeks.
- Conduit stringing and Installation – 2 weeks.
- Backfilling and Site Reinstatement – 1 week.

The durations of the works provided above are based on an assumed (but not limited to) work week of Monday to Friday 7am to 7pm and Saturday from 7am to 2pm and included as part of a Draft Construction Environment Management Plan (CEMP), provided as **Appendix 5A** to the EIAR. Safety requirements for the installation operations / procedures and weather conditions may ultimately dictate the final programme, to be determined based on safety standards of the equipment to be used, and the appropriate contractors.

Phase Two Installation
Subject to approval from the relevant authorities, the second phase of the installation sequence would be focussed on the summer months, i.e. May 2024 to September 2024, to coincide with favourable weather windows for offshore cable installation. The cable may be laid away from or towards the Irish shore. Schedule certainty shall be subject to progress rates from offshore cable installation if the cable is laid towards shore. There would be greater certainty should the offshore cable installation commence in Ireland and be away from shore.

Note the installation of the 3 cables will not occur simultaneously and therefore works described here may need to happen on three separate occasions.

The estimated overall duration for each cable pull-in in phase two is anticipated to take approximately 2 weeks, detailed as follows:

- Mobilisation / Site Preparation / Winch Setup – 1 week.
- Cable Pull (total) – 3 days.
- Cable Jointing Activities / Site Reinstatement – 1 week.

The durations of the works provided above are indicative only and based on a work week Monday to Friday 7am to 7pm and Saturday from7 am to 2pm. The duration of certain works could be shortened by shift-work seven days a week, 24 hours a day. Safety requirements for the installation operations / procedures and weather condition may ultimately dictate the final programme.

Construction Plans

The installation of the Irish landfall forms part of the Construction Environmental Management Plan (CEMP) (**Appendix 5A**) for the Ireland Offshore Works, and also the Ireland Onshore CEMP (**Volume 3C Part 2, Appendix 3.1**). For all onshore installation of the Celtic Interconnector, construction waste management and construction traffic management will be covered by the respective management plans included in the CEMP for the Ireland Onshore Works (**Volume 3C Part 2 – Appendix 3.1, Appendix A Waste Management Plan** and **Volume 3C Part 2 – Appendix 3.1, Appendix B Traffic Management Plan**). The Onshore Environmental Clerk of Works (EnCoW) shall also be responsible for the landfall installation works. For the installation of the offshore elements of the Proposed Development, environmental management measures are set out in the CEMP (**Appendix 5A**) for the Ireland Offshore Works.

Decommissioning

The Celtic Interconnector is strategic infrastructure of National and European importance. While not currently envisaged to occur, it will be decommissioned in the scenario that it ceases operation for an extended period. However, the operational life of the submarine cables, and other equipment, is expected to be 40 years, and it is reasonably envisaged that they will be replaced with new apparatus at that time. If replaced, the submarine cables will either be left in place or will be removed for recycling in accordance with the relevant waste management regulations in place when decommissioning takes place.

Consideration of decommissioning has been included within each of the technical assessment chapters; however, in general potential effects of decommissioning are predicted to be equivalent to, or lesser in, magnitude to those identified and assessed during the construction period.

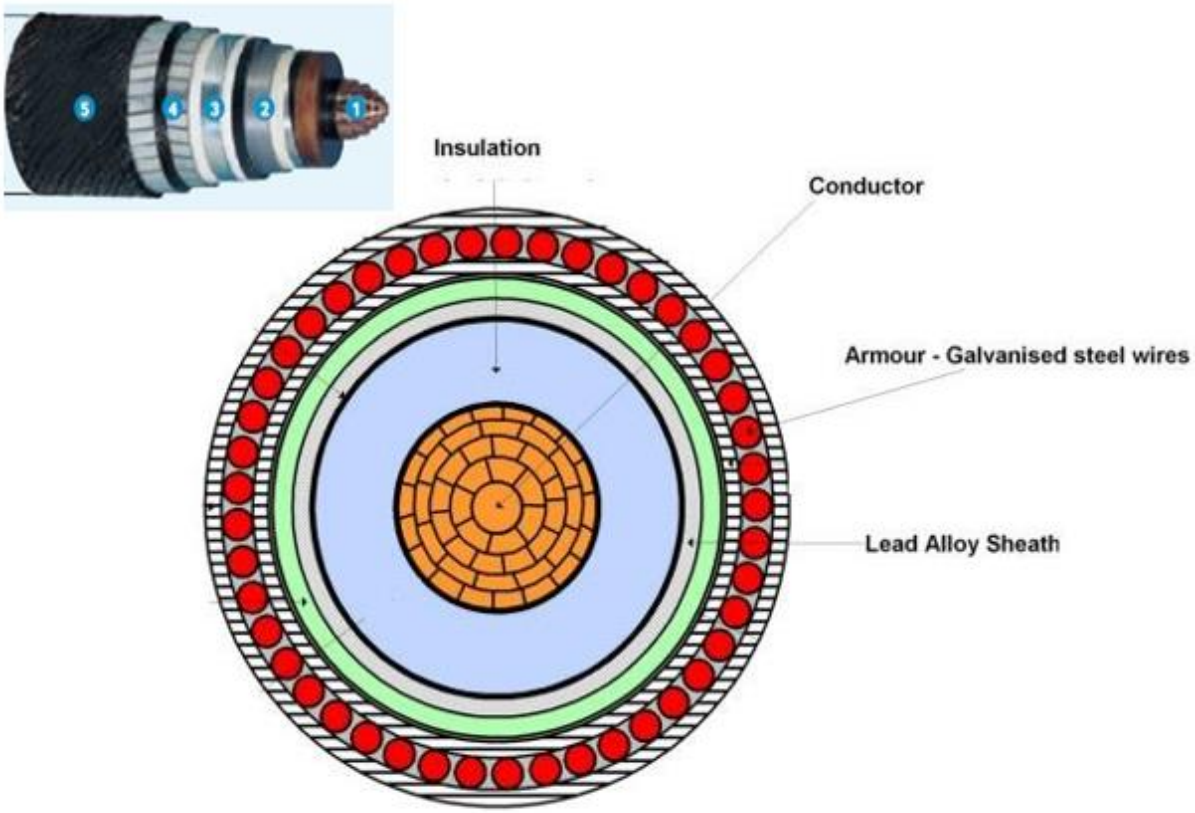
2.4 Description of the Proposed Development – Offshore cable

Works associated with the Celtic Interconnector project within the offshore zone from LAT to the 12nm limit, comprise the laying of a submarine cable package. The submarine cable package is comprised of a pair of electrical cables as well as a fibre optic link with an integrated power supply. The purpose of the fibre optic link is to enable communication and operational control between converter stations at either end of the cable – one in Ireland and one in France. It is anticipated that each electrical cable will have a diameter of between 100mm and 200mm and the fibre optic link will have a dimension of approximately 20mm.

Each electrical cable will use HVDC technology. HVDC is the global standard for the transfer of electricity over long distances in the submarine environment.

Figure 2.17 provides an illustration of a typical cross section for each of the electrical cables. The submarine cables will comprise a number of elements including a central metallic conductor made of copper or aluminium that is surrounded by insulation. A lead alloy sheath will be located outside of the insulation layer; this in turn will be surrounded by armouring that is made of galvanised steel wires. This will all be contained within an external protection layer. The operational life of the electrical cables is expected to be approximately 40 years.

Figure 2.17 Typical Cross-section of Submarine Cable



Cable Route

Irish Territorial Waters

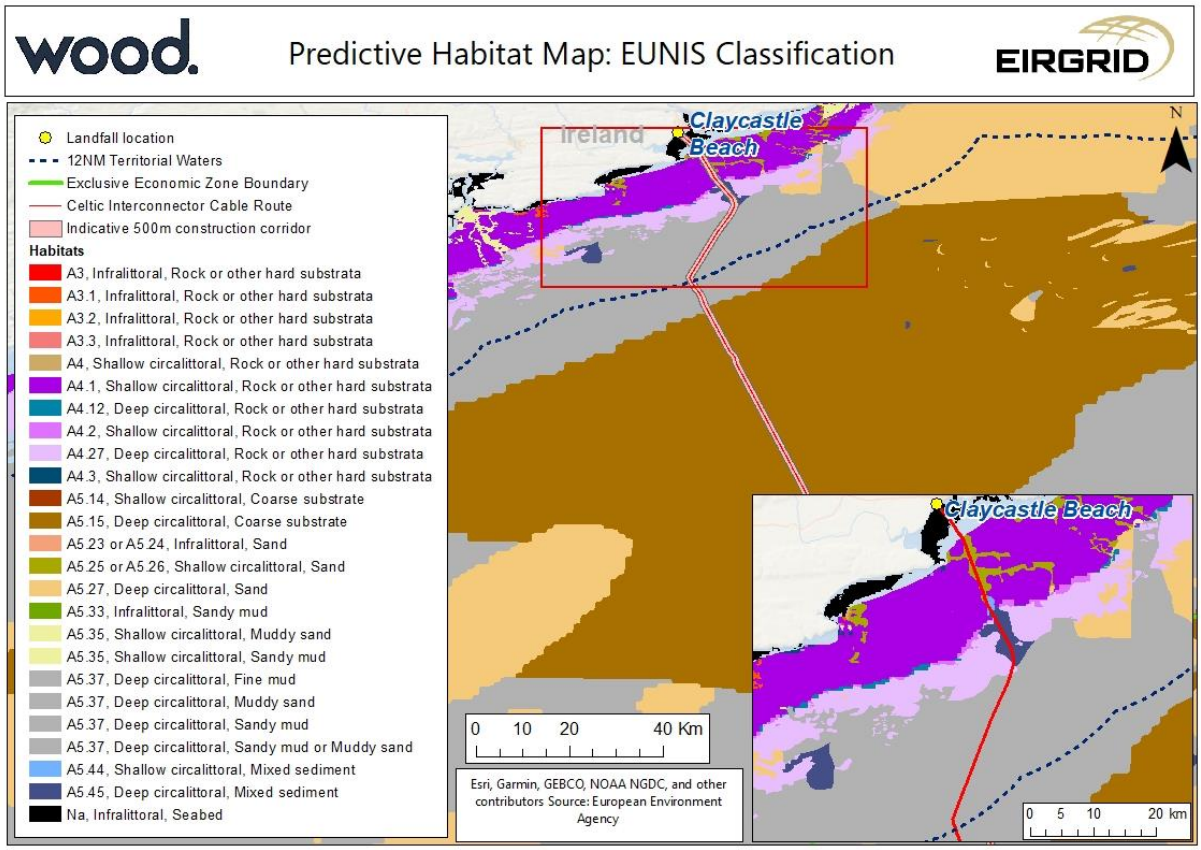
The cable route through Irish Territorial Waters is approximately 35km in length (Kilometre Point (KP) 0.0 to KP 35.0) and extends from Claycastle Beach, County Cork to the 12 nautical mile (nm) limit.

The landfall at Claycastle Beach is located approximately 2km south west of the town of Youghal and is formed by a long gently sloping sandy beach. The intertidal region is approximately 200m long with a sloping gradient of approximately 4 degrees. Beyond the intertidal zone the seabed profile is relatively flat with gentle gradients leading to an uninterrupted smooth progression to the 10m water depth at approximately KP 2.9.

The offshore cable route follows a sediment channel identified within the band of bedrock present along this coastline providing ease of burial to the required target depths. The cables shall be buried beneath the seabed to varying depths between 0.8m and 2.5m depending on identified fishing and shipping risks, seabed conditions along the route and seabed mobility. Following installation, there will be no restrictions on fishing or other activities over the cable.

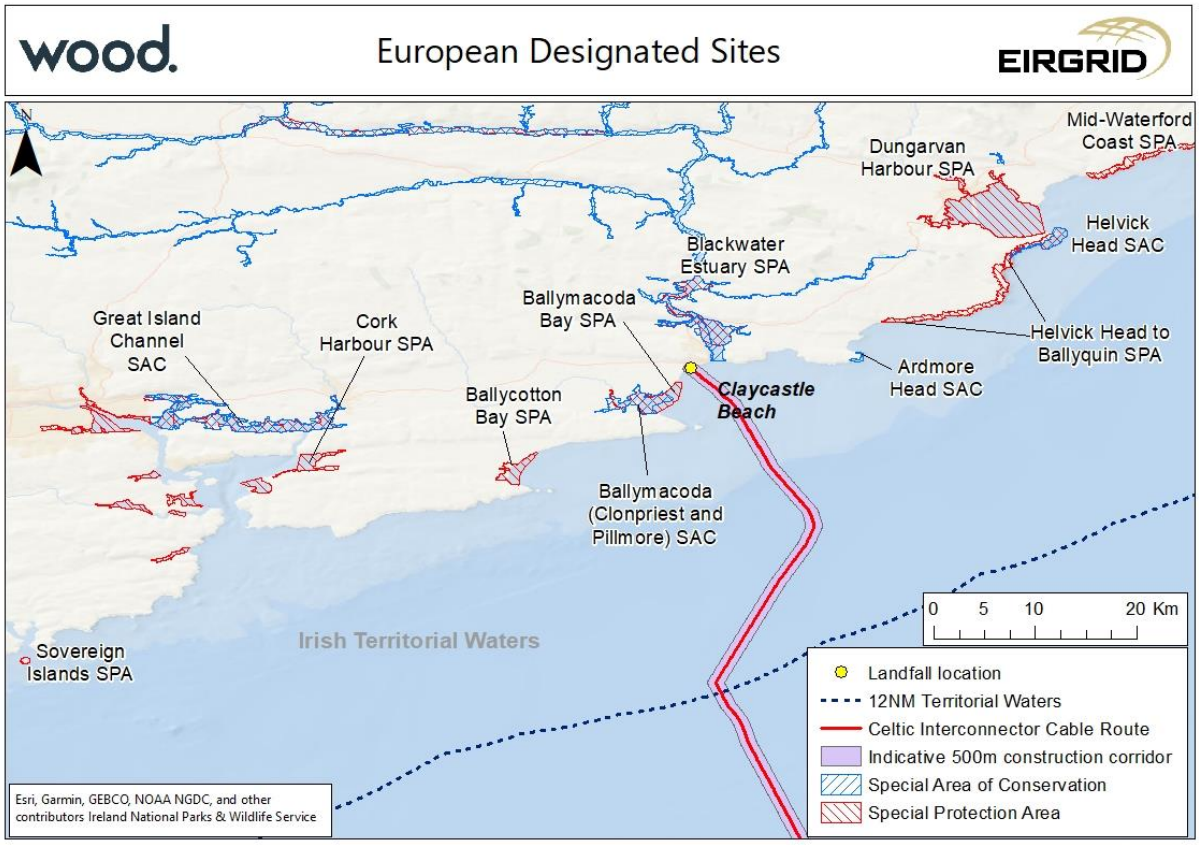
The benthic surveys of the Claycastle Beach approach route (Figure 2.18) indicate that both intertidal and subtidal communities over the proposed cable route have low sensitivity and high resilience to the proposed cable laying. Notably, benthic surveys did not record any potential Annex I habitats protected under the EC Habitats Directive such as pockmark features, biogenic reefs or geological reefs.

Figure 2.18 Irish EEZ – Cable Route and Predictive Habitat Map



The cable route to Claycastle Beach also avoids all European sites designated for nature conservation as shown in Figure 2.19. The route also avoids all nationally designated sites for nature conservation.

Figure 2.19 Irish Territorial Waters – Cable Route and European Designated Sites



The metocean conditions in the area (i.e. combined oceanographic and climatic conditions) are characterised by very weak currents and tides, dissipated swell but strong wind fields. Nearshore, waves approach from a south to south-west direction. Current magnitudes are low (less than 0.15m/s on average), however stronger currents (up to 0.175m/s on average) are observed along the approach to Claycastle Beach due to tidal eddies.

Wave-induced sediment mobility only occurs close to shore with a probability of occurrence of 20%. There is decreasing impact up to the 60m water depth, beyond which there is no more influence on surficial sediments. Current-induced sediment mobility occurs mostly beyond the 80m water depth with a lower probability of occurrence inshore. The sediment thickness that can be impacted by mobility across the offshore part of the route is generally less than 1m.

Erosion and deposition do occur on Claycastle Beach. Evidence for this lies with attempts in the past to control longshore drift by building groynes and dumping rock along the coast. The depth of burial of existing groynes suggests that the beach is more of depositional rather than an erosional environment. The hydro-sedimentary study performed shows that the Claycastle Beach has a low potential for erosion, with 1m erosion expected after a 50-year event.

While nothing of particular archaeological significance was found, peats (potentially Mesolithic) identified on Claycastle Beach are of archaeological potential.

Irish Exclusive Economic Zone

The cable route through the Irish EEZ is approximately 116km in length (KP 35.0 to KP 151.0).

The sediment coverage for the majority of this section of the cable route is considered good, consisting of a combination of dense sand, sandy gravel and high strength clay. There is approximately 33km of the marine route (KP 57.5 to KP 90.7) that has more challenging strata, consisting of underlying chalk. The anticipated target depth of lowering (DOL) of the cable beneath the nominal seabed varies between 0.8m and 2.5m and is based on seabed geology and the variable risk profile that exists from anchor penetration and fishing gear in the vicinity.

The metocean conditions are characterised by weak currents and tides, medium exposure to swell but a very strong wind field.

Current-induced sediment mobility occurs mostly in water depths of 80m or greater. The sediment thickness that can be impacted by mobility along this section of the route is generally less than 1m.

Marine Construction Works
The installation of the submarine cable will typically follow a sequence similar to the following:

- Contractor survey, route engineering and finalisation;
- Unexploded Ordnance (UXO) intervention campaign (if required);
- Boulder clearance;
- Sandwave pre-sweeping (not required in Irish Territorial waters or Irish EEZ);
- Pre-lay grapnel runs;
- Construction of infrastructure crossings;
- Pre-lay route survey;
- Cable lay;
- Post-lay survey;
- Cable burial;
- External / Secondary protection; and
- Post-burial survey.

Survey, Route Engineering and Finalisation
The installation contractor will survey, and have responsibility for, finalisation of the marine route, within the geographical parameters assessed in this EIAR. The contractor will carry out route engineering to optimise conditions for the specific installation tools / techniques to be used. This will include finalisation of extents of areas for boulder clearance, sandwave pre-sweeping, and deployment of the different burial tools.

UXO Clearance
It is not anticipated that UXO clearance will be necessary in Irish waters. Magnetometer surveys undertaken to date (in 2015 and 2018) have not identified a high potential for UXO targets along the cable route in Irish waters. Pre-installation surveys of the cable route will further determine the presence of any UXO. In the unlikely event that UXO are found, they will be either avoided, removed or detonated in situ under licence (informed by relevant environmental assessments) held by the Engineering, Procurement and Construction (EPC) contractor. A full UXO survey campaign will be performed prior to cable installation.

Boulder Clearance
Certain portions of the cable route are populated by boulders in varying concentrations. In the first instance, the recommended approach would always be to avoid problematic targets or areas by detailed route engineering and design. Nevertheless, unavoidable boulders are a common challenge for submarine cable projects in and around the Islands of the North Atlantic and Channel area.

Boulder clearance (where required) is generally undertaken in three ways:

1. The boulders may be pre-cleared using a purpose-built plough, or individually using a grab, in advance of cable lay / burial operations.
2. The boulders may be dealt with on an as-encountered basis. In this case the options available would be limited to use of a grab or (if possible) micro-routing of the cable.
3. The concentration of boulders may be deemed prohibitive, and the decision may be taken to use secondary protection only (e.g. rock placement).

The range of options for boulder mitigation is illustrated against a spectrum of increasing boulder density as shown in Figure 2.20, with examples of clearing equipment presented in Figure 2.21.

Figure 2.20 Boulder Options Summary

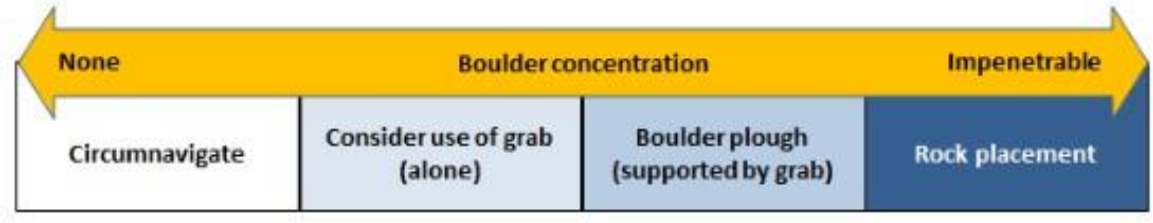


Figure 2.21 Ecosse SCAR Plough (Left) & Boulder Grab (Right)

Sandwave Sweeping

It is not anticipated that sandwave sweeping will be necessary in Irish waters as sandwaves have not been identified in surveys undertaken in respect of the Proposed Development.

Pre-Lay Grapnel Run

Pre-lay grapnel runs will be required along the cable route on the seabed to ensure debris, for example redundant cables, fishing gear, discarded ropes, are cleared in advance of cable lay. The cable footprint on the seabed is anticipated to be approximately 5.0m wide. However, this may increase to approximately 15.0m during seabed preparation and cable installation works due to the size of the equipment deployed for these activities.

Construction of Infrastructure Crossings

Rock placement or concrete mattresses/sleepers will be utilised for the installation of third-party infrastructure crossings. Concrete mattresses are prefabricated and consist of a number of concrete block sections connected by polypropylene rope.

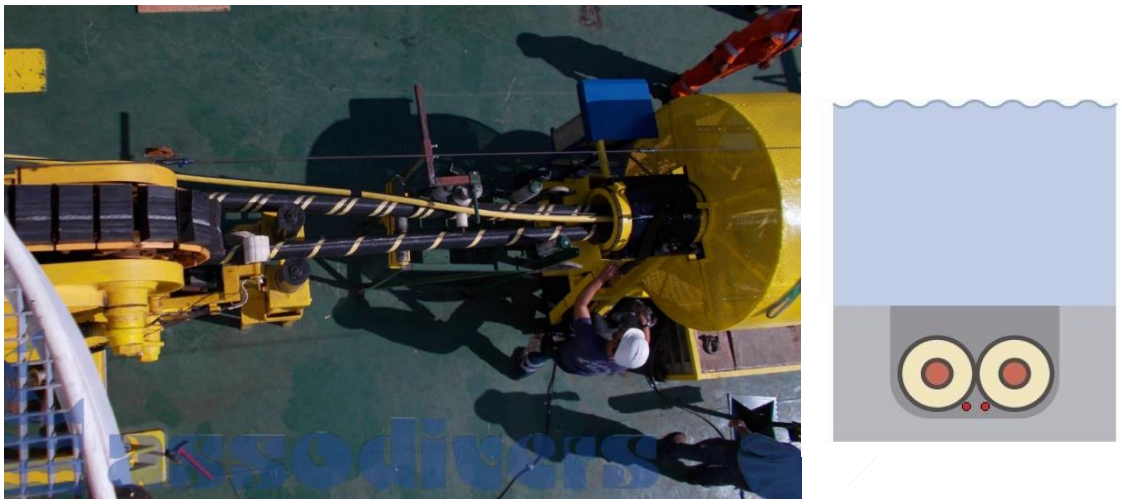
There are six in-service telecommunication cable crossings identified along the cable route in Irish EEZ waters. Each cable crossing will require a specific crossing design to be agreed with each asset owner.

Cable Lay & Burial

It is anticipated that the submarine cable will be installed in a bundled configuration, with the fibre optic link also installed within the bundle. Bundling the cables (as shown in Figure 2.22) ensures the installation footprint is minimised (reducing boulder sweeping and potential rock volumes). There is a wide range of vessels available on the market with the capacity to install cables of the dimensions proposed for the Celtic Interconnector. A number

of high-capacity cable laying vessels have been built in recent years, specifically designed for large cable projects and typically with twin carousels. The submarine cable is loaded on to the cable laying vessels into the carousel located on-board and is fed to the laying arm at the rear of the vessel to be to its position on the ocean floor. The cable laying vessels have the ability to simultaneously lay and bury the cables.

Figure 2.22 Power cables and fibre optic link going through bundle machine (courtesy of AssoDivers)



The burial technique will vary depending on geology of the seabed. The sediment coverage along the cable route is considered good, consisting of a combination of loose to dense sand, dense sandy gravel and high strength clay. Cable installation is envisaged using standard burial tools (plough or a mechanical trenching tool). There should be no requirement for rock trenching. There is approximately 33km of the marine route in the Irish EEZ (KP 57.5 to KP 90.7) that has more challenging strata, consisting of underling chalk. Sections of this route may pose a challenge to cable burial using standard burial tools and may require the use of specialist rock cutting tools for trenching.

Cable burial is the preferred method of cable protection in so far as the underlying seabed geological conditions allow.

Cable burial tools fall broadly into three main categories:

1. Plough;
2. Jetter; and
3. Mechanical Trencher.

Ploughs (such as that presented in Figure 2.23) may be of displacement and non-displacement varieties. Displacement ploughs are used to dig trenches in the sediment in advance of cable installation. A back-filling pass may be employed post lay to close the trench back over the cable. A non-displacement plough works by passing the cable through the plough share to a level below the seabed with minimum disturbance and leaving an effectively closed trench in its wake.

Jetting tools (such as that presented in Figure 2.24) work by fluidisation and are therefore generally used in soft seabeds such as clays and silts, with small grain sizes. They perform less well in sands and gravels, and particularly cobbles. Such conditions may also prevent passage of the jetting swords through the seabed. Water jetting may be employed as a standalone method or form part of a hybrid solution. Jetting (only) tools work by injecting high-pressure water into the soil to fluidise it and allow the cable to sink into the seabed. They are consequently generally used for fairly soft, penetrative soils.

The category of tool most commonly used for the granular sediments that cover the vast majority of the cable route is the mechanical or hybrid trenching machine (Figure 2.25). Such tools are controlled remotely and run on tracked wheels along the seabed, burying the cable beneath the body of the machine.

Specialist heavy duty equipment such as rock cutters may be employed if ground conditions are too difficult to penetrate using standard burial tools.

A Burial Assessment Study (BAS) has been completed for the Proposed Development in accordance with industry guidance recommendations, i.e. Cable Burial Risk Assessment (CBRA). This study identified the target depths of lowering (DOL) of the cable into the seabed along the cable route. The target DOL will vary depending upon seabed geology and also with the variable risk profile that exists from anchor penetration and fishing gear etc.

Figure 2.23 Prysmian Plough

Figure 2.24 Nexans CAPJET Jetter

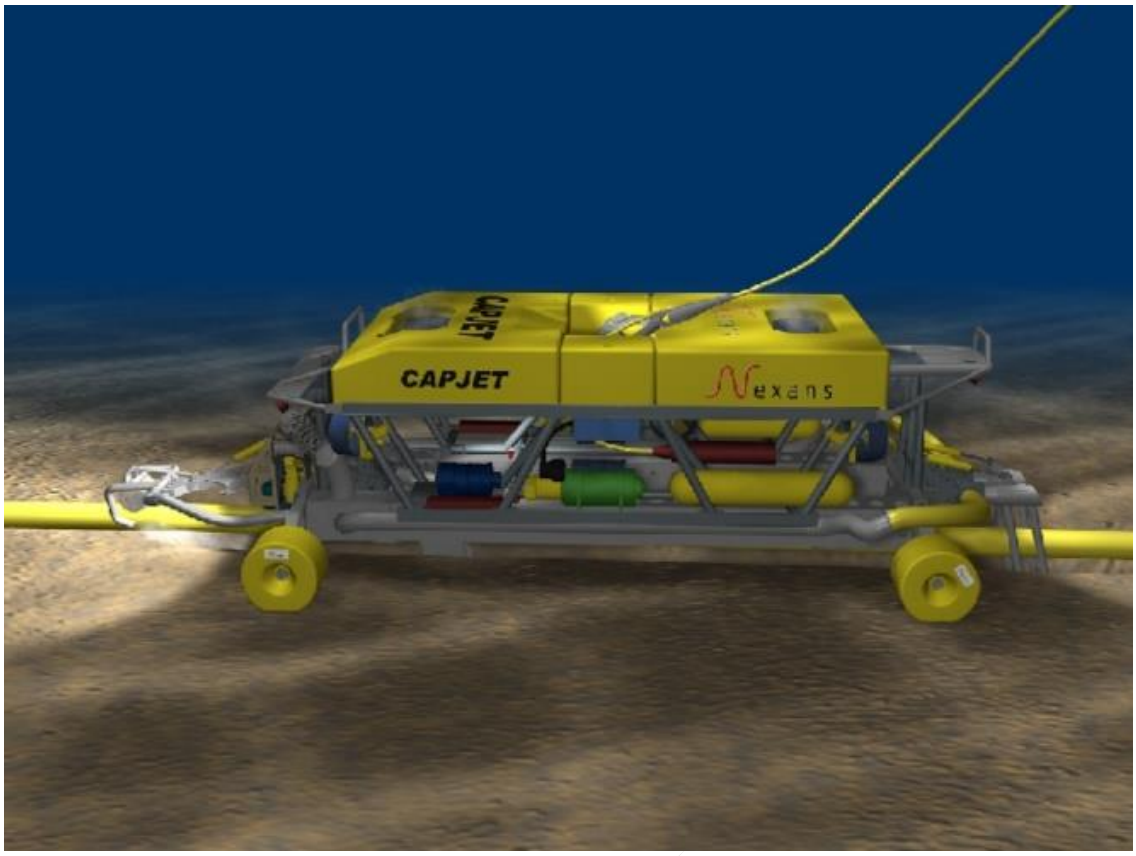


Figure 2.25 ASSO Trencher

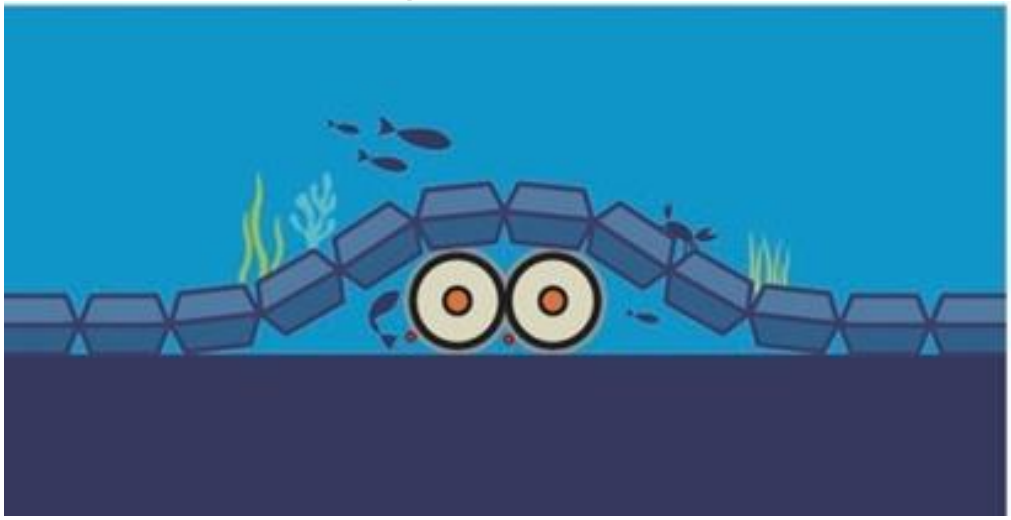
External Protection

Rock placement as a means of primary cable protection is not envisaged along the cable route in Irish waters. Some secondary rock protection may be required where the target DOL is not fully achieved through burial as the primary means of protection. The level of secondary rock protection shall be minimised as much as possible through the best endeavours of the installation contractor to achieve the required level of protection through burial. The level of potential rock protection in Irish territorial waters is between 0km and 3km in the worst case, or 0 tonne to 10 tonnes. The level of potential rock protection in Irish EEZ is between 0km and 30km in the worst case, or 0 tonnes to 80 tonnes.

The primary external protection approach is through rock placement (Figure 2.26). However, a number of other options could be considered, notably concrete mattressing (Figure 2.27). These other options however, are only economic over short distances and are considered a more localised solution (for example at infrastructure crossings). Rock placement will be sourced from regulated quarries.

Figure 2.26 Rock Placement

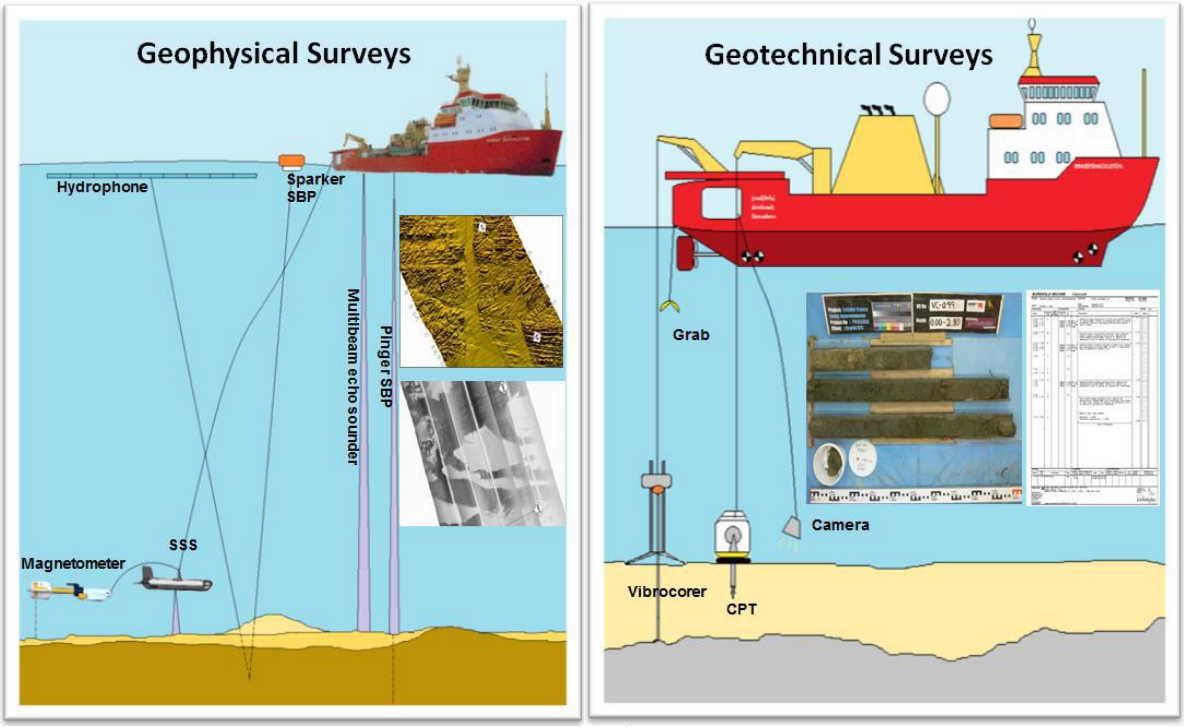
Figure 2.27 Concrete Mattressing



Offshore Construction Traffic

The offshore works involve a number of vessels and activities. The first vessel will be a survey vessel comprising approximately 15 persons on board (POB). This may on occasion require access to Cork Harbour, particularly in adverse weather conditions.

Figure 2.28 Typical Survey Vessels and Activities



The preparatory works shall be carried out in advance of cable lay with a vessel of approximately 30-40 POB. This may on occasion require access to Cork Harbour, particularly in adverse weather conditions.

Figure 2.29 Typical Seabed Preparation Vessels

The cable lay vessel (approx. 90 POB) shall arrive at site fully laden with all equipment required to perform the installation activity. The method to transfer the plough from the vessel to the beach may require an additional abnormal load movement through Cork Port. However, it is envisaged that the plough shall be transferred on a shallow draft barge at high water and lifted by an on-board crane and placed in the receiving pit.

Figure 2.30 Typical Cable Lay Vessels

A rock trenching vessel and rock placement vessel may be required in the Irish EEZ. If these vessels are required, the rock trenching vessel, with approximately 30-40 POB, will perform post-lay burial activities; the rock placement vessel, with approximately 30-40 POB will deploy secondary rock protection.

Figure 2.31 Typical Rock Placement Vessel

There will also be a number of general supply vessels required during the course of construction and also a rock supply vessel if rock placement is required.

Outline Construction Schedule and Timing of Works
Subject to the grant of statutory approvals, it is programmed that installation of the offshore route will commence in 2024, for it to become fully operational in 2027.

Offshore Works
The offshore works involve a number of vessels and activities. The first activity will be the pre-lay survey expected to last 28 days in Irish waters and performed well in advance of the main construction activity.

The preparatory works shall be carried out in advance of cable lay for approximately 30 days in Irish TW and EEZ.

Offshore Cable installation is envisaged using standard burial tools (plough or a mechanical trenching tool). There is approximately 33km of the marine route in the Irish EEZ (KP 57.5 to KP 90.7) that has more challenging strata, consisting of underling chalk. Sections of this route may pose a challenge to cable burial using standard burial tools and may require the use of specialist rock cutting tools for trenching.

The overall schedule for cable lay and burial in Irish Territorial Waters and EEZ excluding weather or mechanical damage stand by is 60 days.

A rock placement vessel, only if required in the Irish EEZ, will follow cable installation and be required in Irish TW and EEZ for between 0 days and approximately 16 days.

The durations of the works provided are indicative only and based on 24/7 operations. Safety requirements for the installation operations / procedures and weather condition may ultimately dictate the final programme.

Decommissioning
The Celtic Interconnector is strategic infrastructure of National and European importance. While not currently envisaged to occur, it will be decommissioned in the scenario that it ceases operation for an extended period. The operational life of the submarine cables, and other equipment, is expected to be at least 40 years, and it is reasonably envisaged that they will be replaced with new apparatus at that time. If replaced, the submarine cables will either be left in place or will be removed for recycling in accordance with the relevant waste management regulations in place when decommissioning takes place. The effects of decommissioning have been considered within each technical chapter, as appropriate, and found that in general, effects are considered to be equivalent to, or smaller, in magnitude, than those described and assessed during construction.

2.5 Identification of the Potential Effects on European sites and the assessment of Likely Significant Effects

In Step 3 the European sites that could be affected by the installation and operation of the Project either alone or in-combination with other plans or projects are identified.

To determine which European sites require consideration within the AA screening for the Project, it is necessary to understand:

- the types of activities associated with the installation, operation and maintenance, and decommissioning of the Project (detailed in Tables 2.3, 2.4 and 2.5);
- the designated features (and associated habitats where applicable)[4] that may be affected by the potential effects identified (based on Annex I habitats and Annex II species listed on the Habitats Directive and Annex I birds listed on the Birds Directive and regularly occurring migratory bird species); and
- the geographic extent over which the potential effects could manifest (see Table 2.3, 2.4, 2.5 and 2.6 for details).

[4] Note that all Annex II species that could be affected if they were present are included in the consideration. At this stage, no determination of likelihood of presence based on distribution, habitat type etc. is made, in order to avoid bias in the definition of search terms. However, where no SACs designated for Annex II species are located within the Zone of Influence these have not been considered in Table 2.1

The activities, potential changes, designated features, and potential effects that have been identified are outlined in Tables 2.3, 2.4 and 2.5, alongside search parameters or references for species specific information. The parameters provide a mechanism for the identification of European sites. Searches, using the parameters in Table 2.3, 2.4, 2.5 and 2.6, have then been undertaken using the specific field survey data collected for the Proposed Development, and associated spatial data sets in ArcGIS including extents of all relevant European sites in Ireland, UK and France, and any national sites where relevant to ex-situ effects. Table 2.4 provides a summary of the species-specific distances used to inform search distances. The results of these searches are provided in Tables 2.7 and 2.8.

From a decommissioning perspective, the operational life of the equipment and apparatus of the Celtic Interconnector Project is expected to be 40 years. Thereafter, it is assumed that the equipment will be decommissioned and replaced with new equipment. Decommissioning impacts have been considered from a noise and vibration perspective, with such effects likely to be of a similar or lesser magnitude than those described and assessed for the construction of the Proposed Development. Prevailing regulations and requirements at the end of the Project's life span would also be adhered to.

Table 2.3 Identification of activities and potential effects associated with offshore route preparation, cable laying and burial used for AA screening of the Project

Receptor(s)	Potential change	Potential effect	Geographic extent or Zone of Influence
Marine Mammals Seabirds Fish Marine Reptiles Benthic habitats and fauna	Physical interaction altering seabed form.	Habitat loss / degradation. Reduction in prey availability for birds, marine mammals, and migratory fish due to habitat change.	Directly along the cable laying route for a width of up to 15m Although the geographic extent of the habitat change is localised, the mobile designated features of European sites may interact with it when remote from the relevant European site.
Marine Mammals Seabirds Fish Marine Reptiles Benthic habitats and fauna	Increases in suspended sediment concentrations created by burial activity.	Reduction in foraging efficiency for birds, marine mammals, and migratory fish due to both direct (e.g. reduction in visual acuity) and indirect effects (e.g. changes in the behaviour of prey). Barrier to movement of migratory fish.	Applying a precautionary approach, the geographic extent of any increase in suspended sediment concentration due to cable burial is not expected to extend more than 10km away from the construction area, with the majority of particles (over 90%) being deposited within 1km (e.g. BERR 2008). The sediment is expected to have settled out within a few hours. Although the geographic extent of the habitat change is localised, the mobile designated features of European sites may interact with it when remote from the relevant European site;
Marine Mammals Seabirds Fish Marine Reptiles Benthic habitats and fauna	Deposition of sediments (smothering) settling out following burial activity.	Smothering of habitats leading to habitat loss / degradation. Reduction in prey availability for birds, marine mammals, and migratory fish due to habitat change	Within 1km of the cable laying route (based on findings reported in ABP Research & Consultancy, 1999[5], and BERR 2008, which noted that the majority of suspended sediment (90%) resettled within 1km of the disturbance zone). Although the geographic extent of the habitat change is localised, the mobile designated features of European sites may interact with it when remote from the relevant European site.

[5] ABP Research & Consultancy (1999) Good practise guidelines for ports and harbours operating within or near UK European marine sites. Available online at: http://ukmpa.marinebiodiversity.org/uk_sacs/pdfs/guidelines.pdf. [Accessed 8 February 2021]

Receptor(s)	Potential change	Potential effect	Geographic extent or Zone of Influence
Marine Mammals Seabirds Fish Marine Reptiles Benthic habitats and fauna	Accidental loss of pollutants, such as fuel or machine oils, during cable laying and burial activity.	Direct toxic/injurious effects of pollutants including hydrocarbons and marine litter.	Dilution effects will vary dependant on at sea conditions and the volume of any pollutant loss. The effects of any pollution events would not be expected to be detectable more than several hundred metres from the location of the incident. Although the geographic extent of the habitat change is localised, the mobile designated features of European sites may interact with it when remote from the relevant European site.
Marine Mammals Seabirds Fish Marine Reptiles Benthic habitats and fauna	Dispersal of existing pollutants potentially within sediments during construction activity.	Direct toxic effects of pollutants including hydrocarbons.	The geographic extent of any increase in suspended sediment concentration due to cable burial is not expected to extend more than 10km away from the construction area, with the majority (over 90%) being deposited within 1km (e.g. BERR, 2008). The sediment is expected to have settled out within a few hours. Although the geographic extent of the habitat change is localised, the mobile designated features of European sites may interact with it when remote from the relevant European site.
Marine Mammals Seabirds Fish Marine Reptiles Benthic habitats and fauna	Production of aural and visual stimuli due to noise and vibration and movement created during survey and construction.	Disturbance / displacement of marine mammals, migratory fish, and birds with effects on fitness due to reduced foraging efficiency and increased energy expenditure to avoid source.	Although the geographic extent of the habitat change is localised, the mobile designated features of European sites may interact with it when remote from the relevant European site.
Marine Mammals Seabirds Fish Marine Reptiles	Increase in vessel movements.	Collision risk to marine mammals due to vessel movements resulting in injury or death.	Although the geographic extent of the habitat change is localised, the mobile designated features of European sites may interact with it when remote from the relevant European site.

Receptor(s)	Potential change	Potential effect	Geographic extent or Zone of Influence
Benthic habitats and fauna			

Table 2.4 Identification of activities and potential effects associated with landfall infrastructure (including site preparation, construction, installation and reinstatement) and search parameters used for AA screening of the Project

Receptor(s)	Potential change	Potential effect	Geographic extent or Zone of Influence
Wintering waterbirds (i.e. waders and waterfowl) Intertidal habitats Marine Mammals	Physical interaction resulting in temporary changes to habitats.	Habitat loss / degradation. Reduction in prey availability and roosting/resting habitat for wintering birds, due to habitat change.	Directly along cable route (corridor width of up to 15m) and construction areas in intertidal zone (see project description). During Phase One approximately 2,860m^2 of intertidal habitats are required for the construction of the sheet pile cofferdam and temporary causeway. Although the geographic extent of the construction and habitat loss is localised, the mobile features of nearby European sites, such as wintering birds may use the habitats present (in particular the intertidal habitats) as ex-situ habitat. Therefore, a search radius of up to 5km (informed by Chapman and Tyldesley 2016) has been applied to identify European Sites with Qualifying Interests recording using the beach and intertidal zone during baseline surveys completed between 2019 and 21).
Wintering waterbirds (i.e. waders and waterfowl)	Production of aural and visual stimuli due to noise and vibration and movement created during survey and construction.	Disturbance / displacement of marine mammals and birds with effects on fitness due to reduced foraging efficiency and increased energy expenditure to avoid source.	Directly along cable route and construction area plus an additional 250m either side due to disturbance (based on Cutts *et al* 2009). Although the geographic extent of the construction and disturbance is localised, mobile features of nearby European sites, such as wintering birds, may use the habitats present (in particular the intertidal habitats) as ex-situ habitat. Therefore, a search radius of up to 5km (informed by Chapman and Tyldesley 2016) has been applied to identify sites with features known to use the beach and intertidal zone (as identified during baseline surveys completed in 2019/20).

Receptor(s)	Potential change	Potential effect	Geographic extent or Zone of Influence
Wintering waterbirds (i.e. Waders and waterfowl) Intertidal habitats Marine Mammals	Accidental loss of pollutants during cable laying and burial activity.	Direct toxic/injurious effects of pollutants including hydrocarbons and marine litter.	The geographic extent of any pollution effects would be restricted to the cable route and supporting construction areas plus an additional buffer of several hundred metres. The extent of any pollution event will depend on prevailing conditions and the nature and volume of any pollutant. Although the geographic extent of the construction and potential pollution is localised mobile features of nearby European sites, such as wintering birds, may use the habitats present (in particular the intertidal habitats) as ex-situ habitat. Therefore, a search radius of up to 5km (informed by Chapman and Tyldesley 2016) has been applied to identify sites with features known to use the beach and intertidal zone (as identified during baseline surveys completed in 2019/20).
Wintering waterbirds (i.e. waders and waterfowl) Intertidal habitats Marine Mammals	Dispersal of pollutants currently within sediments during construction activity.	Direct toxic effects of pollutants including hydrocarbons.	The geographic extent of any pollution effects would be restricted to the cable route, marine construction area, plus an additional buffer of 500m. Although the geographic extent of the construction and potential pollution is localised mobile features of nearby European sites, such as wintering birds, may use the habitats present (in particular the intertidal habitats) as ex-situ habitat. Therefore, a search radius of up to 5km (informed by Chapman and Tyldesley 2016) has been applied to identify sites with features known to use the beach and intertidal zone (as identified during baseline surveys completed in 2019/20).

Table 2.5 Identification of activities and potential effects associated with operation (including survey, maintenance and electricity transmission) and search parameters used for AA screening of the Project

Receptor(s)	Potential change	Potential effect	Geographic extent or Zone of Influence
Marine Mammals Seabirds Wintering waterbirds (i.e. waders and waterfowl) Fish Marine Reptiles	Production of aural and visual stimuli due to noise and vibration and movement created during survey and operation.	Disturbance / displacement of marine mammals, migratory fish, and birds with effects on fitness due to reduced foraging efficiency and increased energy expenditure to avoid source.	Although the geographic extent of the habitat change is localised, the mobile designated features of European sites may interact with it when remote from the relevant European site. Maintenance or other works during operation at the landfall location have the potential to cause disturbance events local to the cable route and other associated infrastructure. For wintering birds, the presence of personnel and/or plant on or close to intertidal habitats has previously been identified as causing "High" or "Moderate" levels of disturbance within 250m (Cutts *et al* 2009), displacing birds from foraging or resting areas. The approach for identifying effects on European sites follows the approach considered for disturbance during the construction phase and a search radius of up to 5km (informed by Chapman and Tyldesley 2016) has been applied to identify any European sites with mobile features which may use the proposed landfall location (and surrounding habitat) as ex-situ habitat.
Marine Mammals Seabirds Fish Marine Reptiles	Increase in vessel movements.	Collision risk to marine mammals due to vessel movements resulting in injury or death.	Although the geographic extent of the vessel movements is localised, mobile designated features of European sites may interact with it when remote from the relevant European site.
Marine Mammals Fish Marine Reptiles	Electro-magnetic fields (EMF) created during cable operation.	Interference in the behaviour of migratory fish and marine mammals.	Although the geographic extent of EMF is localised (within 20m of the cable – Taormina *et al*., 2018), the mobile designated features of European sites may interact with it when remote from the relevant European site.

Table 2.6 Summary of species-specific search distances and source information used to identify potential effects on European Sites

Species	Approximate search distance	Source
Black guillemot	4.8km	
Black-headed gull	19km	Woodward et al (2019), 'Desk-based revision of seabird foraging ranges used for HRA screening', BTO research report no.724, BTO
Common gull	50km	
Cormorant	26km	
Fulmar	542km	
Gannet	315km	
Guillemot	73.2	
Herring gull	59km	
Kittiwake	156km	
Leach's storm petrel	657km*	
Lesser black backed	127km	
Manx shearwater	1387km	
Puffin	137km	
Razorbill	88.7km	
Storm petrel	336km	
Non-breeding water birds	5km	Chapman, C. & Tyldesley, D. (2016). Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects - a review of authoritative decisions. Natural England Commissioned Reports, Number 207
Grey seal	145km	Sea Mammal Research Unit (SMRU) (2011) Scientific Committee On Seals (SCOS) Scientific advice on matters related to the management of seal populations: 2011.
Common seal	120km	

Species	Approximate search distance	Source
		Thompson, P. M., McConnell, B. J., Tollit, D. J., MacKay, A., Hunter C., and Racey. P. A. (1996) Comparative distribution, movements and diet of harbour and grey seals from Moray Firth, NE Scotland. Journal of Applied Ecology, 33(6):1572-1584.
Harbour Porpoise	All sites which include Harbour Porpoise within the Celtic Sea Management Unit for Cetaceans	IAMMWG, (2015), Management Units for cetaceans in UK waters (January 2015), JNCC Report No. 547, JNCC, Peterborough, ISSN 0963-8091.
Bottlenose Dolphin	All sites which include Bottlenose dolphin within the Offshore Channel, Celtic Sea and South West England Management Unit for Cetaceans	IAMMWG, (2015), Management Units for cetaceans in UK waters (January 2015), JNCC Report No. 547, JNCC, Peterborough, ISSN 0963-8091.
Migratory Fish species	100km	The distance of 100km has been applied using professional judgement. This is based on both a precautionary consideration of the ecology of the species being considered and the general acceptance of this figure in ecological assessments of various offshore cable and offshore wind farm projects.

*Only a mean figure is available for Leach's Storm Petrel based on a single study.

2.6 Summary of AA Screening Assessment

Tables 2.7 (SACs) and Table 2.8 (SPAs) list the European sites identified using the search parameters laid out in Tables 2.3, 2.4, 2.5 and 2.6.

In addition, Tables 2.7 and 2.8 identify the potential effects on each European site as a result of the Proposed Development and outlines the results of the AA Screening assessment.

Table 2.7 Potential effects of the Project on Special Areas of Conservation

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
Blackwater River (Cork/Waterford) SAC - 002170	1.4	NPWS (2012a): Qualifying Interests potentially within the ZoI of identified effects • Sea Lamprey • River Lamprey • Twaite Shad • Atlantic Salmon Other Qualifying Interests included in site conservation objectives • Estuaries* (* indicates Annex 1 habitat types) • Mudflats and sandflats not covered by seawater at low tide • Perennial vegetation of stony banks*	Habitat loss / degradation. Disturbance / displacement due to aural and visual stimuli. Disturbance of migratory pathway. Displacement from foraging grounds. Direct toxic effects of pollutants including hydrocarbons. EMF.	No LSE. The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation (RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock	**No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual fish in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on migratory fish will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Salicornia and other annuals colonising mud and sand* • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)* • Mediterranean salt meadows (*Juncetalia maritimi*)* • Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation • Old sessile oak woods with Ilex and Blechnum in the British Isles • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion*		and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. Waterborne noise generated by cable laying vessels, cable burial and cable protection placement does not occur at levels (155 to 180 dB re 1 µPa @ 1m depending on vessel type) great enough to result in either temporary or permanent auditory or non-auditory effects (Inch Cape Offshore Limited 2013, Niras 2015, Natural Power 2018). Waterborne noise however from activities such as placement of rock for cable protection	from the cable is not expected to affect migratory fish and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		incanae, Salicion albae)* • Freshwater Pearl Mussel *Margaritifera margaritifera* • Brook Lamprey *Lampetra planeri* • White-clawed Crayfish *Austropotamobius pallipes* • Otter *Lutra lutra* • Killarney Fern *Trichomanes speciosum*		and route clearance may result in localised and temporary behavioural effects (such as displacement). The presence of cable laying and support vessels (unweighted noise levels of 155 to 180dB re 1µPa @ 1m depending on vessel type, as above, and in line with existing vessel traffic in the area) is considered unlikely to alter the baseline situation for the individuals present in the area given the level of vessel traffic already present. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect.	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked change in foraging or navigational ability. Collision with vessels is not considered to present a risk to fish or mammal species due to the slow progress of the vessels laying the cable (20 to 300m per hour dependent on substrate), its predictable path, and the agility of the species in question. This aligns with	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				the literature published on this issue (Palka & Hammond 2001).	
River Barrow and River Nore SAC - 002162	6.5	NPWS (2012b): Qualifying Interests potentially within the ZoI of identified effects • Sea Lamprey • River Lamprey • Twaite Shad • Atlantic Salmon Other Qualifying Interests included in site conservation objectives • Estuaries* • Mudflats and sandflats not covered by seawater at low tide • Reefs* • Salicornia and other annuals colonising mud and sand* • Atlantic salt meadows (Glauco-	Habitat loss / degradation. Disturbance / displacement due to aural and visual stimuli. Disturbance of migratory pathway. Displacement from foraging grounds. Direct toxic effects of pollutants including hydrocarbons. EMF.	No LSE. The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation (RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be	**No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual fish in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on migratory fish will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Puccinellietalia maritimae)* • Mediterranean salt meadows (*Juncetalia maritimi*)* • Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation • European dry heaths* • Hydrophilous tall herb* fringe communities of plains and of the montane to alpine levels • Petrifying springs with tufa formation (*Cratoneurion*)* • Old sessile oak woods with Ilex and		deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. Waterborne noise generated by cable laying vessels, cable burial and cable protection placement does not occur at levels (155 to 180 dB re 1 µPa @ 1m depending on vessel type) great enough to result in either temporary or permanent auditory or non-auditory effects (Inch Cape Offshore Limited 2013, Niras 2015, Natural Power 2018). Waterborne noise however from activities such as placement of rock for cable protection and route clearance may result in	expected to affect migratory fish and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Blechnum in the British Isles • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)* • Desmoulins's Whorl Snail *Vertigo moulinsiana* • Freshwater Pearl Mussel • White-clawed Crayfish • Brook Lamprey • Otter • Killarney Fern • Nore Pearl Mussel *Margaritifera durrovensis*		localised and temporary behavioural effects (such as displacement). The presence of cable laying and support vessels (unweighted noise levels of 155 to 180dB re 1µPa @ 1m depending on vessel type, as above, and in line with existing vessel traffic in the area) is considered unlikely to alter the baseline situation for the individuals present in the area given the level of vessel traffic already present. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				with navigation and foraging efficiency of migratory fish species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked change in foraging or navigational ability. Collision with vessels is not considered to present a risk to fish or mammal species due to the slow progress of the vessels laying the cable (20 to 300m per hour dependent on substrate), its predictable path, and the agility of the species in question. This aligns with the literature published on this issue (Palka & Hammond 2001).	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
Lower River Suir SAC - 002137	37.5	• NPWS (2012c): Qualifying Interests potentially within the ZoI of identified effects • Sea Lamprey • River Lamprey • Twaite Shad • Atlantic Salmon Other Qualifying Interests included in site conservation objectives • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)* • Mediterranean salt meadows (*Juncetalia maritimi*)* • Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Habitat loss / degradation. Disturbance / displacement due to aural and visual stimuli. Disturbance of migratory pathway. Displacement from foraging grounds. Direct toxic effects of pollutants including hydrocarbons. EMF.	No LSE. The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation (RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a	**No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual fish in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on migratory fish will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect migratory fish and therefore regardless of

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels* • Old sessile oak woods with Ilex and Blechnum in the British Isles • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)* • *Taxus baccata* woods of the British Isles* • Freshwater Pearl Mussel • White-clawed Crayfish • Brook Lamprey • Otter		detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. Waterborne noise generated by cable laying vessels, cable burial and cable protection placement does not occur at levels (155 to 180 dB re 1 µPa @ 1m depending on vessel type) great enough to result in either temporary or permanent auditory or non-auditory effects (Inch Cape Offshore Limited 2013, Niras 2015, Natural Power 2018). Waterborne noise however from activities such as placement of rock for cable protection and route clearance may result in localised and temporary behavioural	the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				effects (such as displacement). The presence of cable laying and support vessels (unweighted noise levels of 155 to 180dB re 1µPa @ 1m depending on vessel type, as above, and in line with existing vessel traffic in the area) is considered unlikely to alter the baseline situation for the individuals present in the area given the level of vessel traffic already present. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				efficiency of migratory fish species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked change in foraging or navigational ability. Collision with vessels is not considered to present a risk to fish or mammal species due to the slow progress of the vessels laying the cable (20 to 300m per hour dependent on substrate), its predictable path, and the agility of the species in question. This aligns with the literature published on this issue (Palka & Hammond 2001).	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
Lower River Shannon SAC - 002165[6]	76	NPWS (2012d): Qualifying Interests potentially within the ZoI of identified effects • Bottlenose Dolphin Other Qualifying Interests included in site conservation objectives • Freshwater Pearl Mussel • Sea Lamprey • Brook Lamprey • River Lamprey • Atlantic Salmon • Sandbanks which are slight covered by sea water all the time* • Estuaries* • Mudflats and sandflats not covered	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual bottlenose dolphin in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on bottlenose dolphin will not alter as

[6] Pathways for connectivity between the European Site and the Proposed Development are greater than the straight line distance. For example, the straight line distance between Lower River Shannon SAC and the Proposed Development is 76km, however connectivity for features reliant on marine connectivity are much greater (>300km).

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		by seawater at low tide • Coastal lagoons* • Large shallow inlets and bays* • Reefs* • Perennial vegetation of stony banks* • Vegetated sea cliffs of the Atlantic and Baltic coasts* • *Salicornia* and other annuals colonizing mud and sand • Atlantic salt meadows (*Glauco-puccinellietalia maritimae*)* • Otter • Mediterranean salt meadows (*Juncetalia*)* • Water courses of plain to montane levels with the		(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect bottlenose dolphin and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Ranunculion fluitantis and *Callitricho - Batrachion* vegetation • *Molinia* meadows on calcareous, peaty of clayey-silt-laden soils (*Molinion caeruleae)** • Alluvial forests with *Alnus glutinosa* and *Franxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion abae*)*		specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish and marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				change in foraging or navigational ability.	
Saltee Islands SAC - 000707	78	• NPWS (2012e): • Qualifying Interests potentially within the ZoI of identified effects • Grey seal Other Qualifying Interests included in site conservation objectives • Mudflats and sandflats not covered by seawater at low tide • Large shallow inlets and bays* • Reefs* • Vegetated sea cliffs of the Atlantic and Baltic coasts*	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual grey seal in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on grey seal will

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Submerged or partially submerged sea caves*		(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect grey seal and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				change in foraging or navigational ability.	
Slaney River Valley SAC - 000781	96	NPWS (2012f): Qualifying Interests potentially within the ZoI of identified effects • Sea Lamprey • River Lamprey • Twaite Shad • Atlantic Salmon Common Seal *Phoca vitulina* Other Qualifying Interests included in site conservation objectives • Estuaries* • Mudflats and sandflats not covered by seawater at low tide • Atlantic salt meadows (*Glauco-*	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Disturbance of migratory pathways. Displacement from foraging grounds. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual common seal in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on common seal

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Puccinellietalia maritimae)* • Mediterranean salt meadows (*Juncetalia maritimi*)* • Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation • Old sessile oak woods with Ilex and Blechnum in the British Isles • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae, Salicion albae*)* • Freshwater Pearl Mussel • Brook Lamprey		(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect common seal and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				change in foraging or navigational ability.	
Roaring water Bay and Islands SAC 000101	107	NPWS (2012g): Qualifying Interests potentially within the ZoI of identified effects • Harbour Porpoise • Grey Seal Other Qualifying Interests included in site conservation objectives • Large shallow inlets and bays* • Reefs* • Vegetated sea cliffs of the Atlantic and Baltic coasts* • European dry heaths* • Submerged or partially submerged sea caves*	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual harbour porpoise or grey seal in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Otter		(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	effects on harbour porpoise or grey seal will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect harbour porpoise or grey seal and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				change in foraging or navigational ability.	
Blasket Islands SAC - 002172	179	NPWS (2012h): Qualifying Interests potentially within the ZoI of identified effects • Harbour Porpoise Other Qualifying Interests included in site conservation objectives • Reefs* • Vegetated sea cliffs of the Atlantic and Baltic coasts* • European dry heaths* • Submerged or partially submerged sea caves* • Grey Seal	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual harbour porpoise in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on harbour

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	porpoise will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect harbour porpoise and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

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				change in foraging or navigational ability.	
Rockabill to Dalkey Island SAC - 003000	189	NPWS (2012i): Qualifying Interests potentially within the ZoI of identified effects • Harbour Porpoise Other Qualifying Interests included in site conservation objectives • Reefs*	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual harbour porpoise in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on harbour

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	porpoise will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect harbour porpoise and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

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				change in foraging or navigational ability.	
West Connacht Coast SAC - 002998	228	NPWS (2012j): Qualifying Interests potentially within the ZoI of identified effects • Bottlenose dolphin	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual bottle nose dolphin in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on bottlenose

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				(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	dolphin will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect bottlenose dolphin and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

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				change in foraging or navigational ability.	
Isles of Scilly complex SAC – UK0013694	96	Natural England (2018): Qualifying Interests potentially within the ZoI of identified effects • Grey seal Other Qualifying Interests included in site conservation objectives • Sandbanks which are slightly covered by sea water all the time • Mudflats and sandflats not covered by seawater at low tide • Reefs* • Shore dock	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual grey seals in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on grey seal will

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect grey seal and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

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				change in foraging or navigational ability.	
Bristol Channel Approaches / Dynesfeydd Mor Hafren SAC UK0030396	132	JNCC (2019) Qualifying Interests potentially within the ZoI of identified effects • Harbour Porpoise	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual harbour porpoise in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on harbour

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	porpoise will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect harbour porpoise and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				change in foraging or navigational ability.	
Pembrokeshire Marine / Sir Benfro Forol SAC	134	Natural Resources Wales (2018): Qualifying Interests potentially within the ZoI of identified effects • Grey seal Other Qualifying Interests included in site conservation objectives • Estuaries* • Large shallow inlets and bays • Reefs* • Sandbanks which are slightly covered by sea water all the time • Mudflats and sandflats not covered by seawater at low tide • Coastal lagoons • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)*	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual grey seals in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on grey seal will

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Submerged or partially submerged sea caves • Shore dock • Sea lamprey • River lamprey • Allis shad • Twaite shad • Otter		(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect grey seal and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				change in foraging or navigational ability.	
West Wales marine / Gorllewin Cymru Forol SAC	146	JNCC (2019b) Qualifying Interests potentially within the ZoI of identified effects • Harbour Porpoise	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual harbour porpoise in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on harbour

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	porpoise will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect harbour porpoise and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				change in foraging or navigational ability.	
Cardigan Bay / Bae Ceredigion SAC	194	Natural Resources Wales (2018b) Qualifying Interests potentially within the ZoI of identified effects • Bottlenose dolphin Other Qualifying Interests included in site conservation objectives • Sandbanks which are slightly covered by seawater all the time • Reefs* • Submerged or partially submerged sea caves • Sea lamprey • River lamprey • Grey seal	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual bottlenose dolphin in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on bottlenose

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	dolphin will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect bottlenose dolphin and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				change in foraging or navigational ability.	
Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC	222	Natural Resources Wales (2018c) Qualifying Interests potentially within the ZoI of identified effects • Bottlenose dolphin Other Qualifying Interests included in site conservation objectives • Sandbanks which are slightly covered by sea water all the time • Estuaries* • Coastal lagoons • Large shallow inlets and bays • Reefs* • Mudflats and sandflats not covered	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual bottlenose dolphin in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on bottlenose

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		by seawater at low tide • Salicornia and other annuals colonizing mud and sand* • Atlantic salt meadows (*Glauco-Puccinellietalia*)* • Submerged or partially submerged sea caves • Otter • Grey seal		(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	dolphin will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect bottlenose dolphin and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				change in foraging or navigational ability.	
North Anglesey Marine / Gogledd Mon Forol SAC	234	JNCC (2019c) Qualifying Interests potentially within the ZoI of identified effects • Harbour Porpoise	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual harbour porpoise in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on harbour

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	porpoise will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect harbour porpoise and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				change in foraging or navigational ability.	
North Channel SAC UK0030399	293	JNCC (2019d) Qualifying Interests potentially within the ZoI of identified effects • Harbour Porpoise	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual harbour porpoise in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on harbour

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				(RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-	porpoise will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect harbour porpoise and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked	

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				change in foraging or navigational ability.	
ZSC Anse de Goulven, dunes de Keremma FR5300016	308	(INPN, 2021a) Qualifying Interests potentially within the ZoI of identified effects • Common seal (in-combination only) • Grey seal (in-combination only)	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	No LSE for all effects when considering the project alone European site supports grey seal and common seal but is located more than 300km from the Irish section of the Proposed Development.	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels **No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual harbour porpoise in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on harbour

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
					porpoise will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF from the cable is not expected to affect harbour porpoise and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.
ZSC Abers – Côtes des Légendes FR5300017	292	INPN (2021b) Qualifying Interests potentially within the ZoI of identified effects • Harbour porpoise • Bottlenose dolphin	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Common seal (in-combination only) • Grey seal (in-combination only)	Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation (RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column	**No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual harbour porpoise, bottlenose dolphin, common seal or grey seal in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on harbour porpoise, bottlenose dolphin, common seal and grey seal will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging	at any one time. EMF from the cable is not expected to affect harbour porpoise, bottlenose dolphin, common seal and grey seal and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked change in foraging or navigational ability.	
Baie de Morlaix FR5300015	314	(Natura 2000, 2021) Qualifying Interests potentially within the ZoI of identified effects • Harbour porpoise • Grey seal (in-combination only)	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
			Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation (RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column	**No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual harbour porpoise or grey seal in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on harbour porpoise and grey seal will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. EMF

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging	from the cable is not expected to affect harbour porpoise and grey seal and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked change in foraging or navigational ability.	
Mers Celtiques - Talus du golfe de Gascogne FR5302015	195	European Environment Agency (2017) Qualifying Interests potentially within the ZoI of identified effects • Harbour porpoise • Bottlenose dolphin	Habitat loss / degradation. Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli.	LSE predicted for: Disturbance / displacement due to aural and visual stimuli Collision with vessels No LSE for all other effects The European Site features a number of species and habitats	**LSE in-combination with other plans and projects predicted for:** Disturbance / displacement due to aural and visual stimuli Collision with vessels

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
			Direct toxic effects of pollutants including hydrocarbons. EMF. Collision with vessels.	which would not be impacted by the proposed works due to the distance between localized effects and the European Site. The cable route occupies a very small area of the seabed which could intersect with the potential range of the highlighted features of the European site. The disturbance to the seabed will be temporary, in particular in the sand and gravel substrates which are present along the majority of the route. As the substate would re-establish rapidly (within a period of days or weeks) following installation (RPS 2019) this effect is not expected to result in a marked change in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. In locations where rock and mattress protection needs to be deployed this will not have a detrimental impact to the species listed. Suspended sediments would largely be deposited from the water column	**No LSEs in-combination with other plans and projects for other potential effects.** None of the potential effects for which no LSE is predicted alone for the Proposed Development alone are considered likely to affect the fitness of individual harbour porpoise or bottlenose dolphin in the wider population. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on harbour porpoise or bottlenose dolphin will not alter as the habitat loss / degradation will remain a small part of the area used by these species and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				close to the works (90% within 1km) and within a few hours of disturbance. This would occur in a highly localised area. Given the modest progress of the cabling vessel (20-300m per hour dependent on substrate), it will be easy for individual fish and/or mammal species to pass through or avoid without significantly affecting their behaviour. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages, and the low levels of contaminants recorded in seabed sediments during site-specific surveys along the cable route in 2015. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. The EMF produced by an operational cable has the potential to interfere with navigation and foraging	at any one time. EMF from the cable is not expected to affect harbour porpoise or bottlenose dolphin, and therefore regardless of the location in-combination effects are not expected. No other plans or projects have been identified that would lead to in-combination effects.

Site name/Code	Distance (km)	Designated features (*=Priority)	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				efficiency of migratory fish or marine mammal species. However, Subsea cable interactions with the marine environment: expert review and recommendations report (Andrulewicz et al. 2003) recorded no difference to natural background levels within 20m of the SwePol link cable, a 254km HVDC cable in the Baltic Sea. On this basis the effect of the Proposed Development would be highly localised, in waters deep enough to allow a modest change in individuals' swim profile (their location within the water column) to enable crossing in an unaffected area and would not result in a marked change in foraging or navigational ability.	

Table 2.8 Potential effects of the Project on Special Protection Areas (rows highlighted in green indicate sites for which LSEs could not be excluded)

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
Ballymacoda Bay SPA - 004023	1	NPWS (2012k): Qualifying Interests potentially within the ZoI of identified effects Non-breeding populations of: • Teal *Anas crecca* • Grey Plover *Pluvialis squatarola* • Sanderling • Bar-tailed Godwit • Curlew • Ringed Plover *Charadrius hiaticula* • Black-headed Gull *Chroicocephalus ridibundus* • Common Gull *Larus canus* • Lesser Black-backed Gull *Larus fuscus*	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	LSE identified in relation to landfall construction and installation[7] Temporary habitat loss associated with the landfall connection does not directly impact areas of Ballymacoda Bay SPA (the closest point being 1.7km to the SW), however bird species present at the European Site during the non-breeding period have the potential to utilise areas of un-designated habitat for foraging and roosting which will be temporarily unavailable during construction and installation, scheduled to take place between October and April (year subject to confirmation) for a 10 week period. Whilst it is not anticipated that the temporary loss of this habitat would result in a marked change in availability of prey or resting/roosting habitats for the designated features of the European site a Potential Significant Effect cannot be ruled out. Further consideration of this effect is provided in Section 3.	LSE identified in relation to landfall and onshore construction and installation Disturbance associated with construction and installation of the cable route above the MHWM will not have a direct impact on the European site being more than 1.5km to the SW of the Site. However, wading birds and waterfowl listed as designated features have the potential to utilise areas of un-designated habitat for foraging and roosting which may be impacted. Whilst is not anticipated that the temporary disturbance would result in a marked change in prey or habitat availability for the designated features of the European site a Potential Significant Effect cannot be ruled out. Further

[7] LSE only predicted if Cable installation method 1 is taken forward. If Option 2 is taken forward no LSE is predicted to occur alone or in combination.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Other Qualifying Interests included in site conservation objectives Non-breeding populations of: • Wigeon *Anas Penelope* • Golden Plover *Pluvialis apricaria* • Lapwing *Vanellus vanellus* • Dunlin *Calidris alpine* • Black-tailed Godwit • Redshank *Tringa tetanus* • Turnstone • Wetland and Waterbirds assemblage.		Disturbance associated with construction and installation of the cable route at the landfall location will not have a direct impact on the European site being more than 1.5km to the SW of the Site. However, wading birds and waterfowl listed as designated features have the potential to utilise areas of un-designated habitat for foraging and roosting which may be impacted. Whilst is not anticipated that the temporary disturbance would result in a marked change in prey or habitat availability for the designated features of the European site a Potential Significant Effect cannot be ruled out. Further consideration of this effect is provided in Section 3. No LSE in relation to offshore activities. Of the SCI features listed, only black-headed gull, common gull and lesser black-backed gull would occur in offshore habitats and have any potential to be affected by the offshore elements of the cable route. Offshore, the cable route occupies a very small area of the seabed in comparison with the potential coverage of common gull, lesser black-backed gull or black-	consideration of this effect is provided in Section 3. No LSE in-combination with other plans and projects in relation to offshore activities. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European sites or the wider populations of these species. They are of a scale (both spatially and temporally) that additive effects (i.e. in-combination) will not occur. No other plans or projects have been identified that would lead to in-combination effects

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				headed gull (based on mean maximum foraging distance off these species). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels and other plant installing or maintaining the cable is low given the standard operating procedure for offshore and intertidal works. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect and control of potential pollution events. This would not result in any LSE on the designated features of the European Site.	
Blackwater Estuary SPA - 004028	2.6	NPWS (2012l): Qualifying Interests potentially within the ZoI of identified effects	Reduction in prey availability due to habitat change, suspended sediment or survey,	LSE identified in relation to landfall construction and installation.[7] Temporary habitat loss associated with the landfall connection does not directly	LSE identified in relation to landfall and onshore construction and installation

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Non-breeding populations of: • Bar-tailed Godwit • Curlew Other Qualifying Interests included in site conservation objectives Non-breeding populations of: • Wigeon • Golden plover • Lapwing • Dunlin • Black-tailed godwit • Redshank • Wetland and waterbird assemblage	construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	impact areas of Blackwater Estuary SPA (the closest point being 2.6km to the SW of the Site), however wading birds present at the European Site during the non-breeding period have the potential to utilise areas of un-designated habitat for foraging and roosting which will be temporarily unavailable during construction and installation, scheduled to take place between October and April () for a 10 week period. Whilst it is not anticipated that the temporary loss of this habitat would result in a marked change in availability of prey or resting/roosting habitats for the designated features of the European site a Potential Significant Effect cannot be ruled out. Further consideration of this effect is provided in Section 3. Disturbance associated with construction and installation of the cable route at the landfall location will not have a direct impact on the European site being more than 2km to the north-west of the construction area. However, wading birds and waterfowl listed as designated features of the European Site have the potential to	Disturbance associated with construction and installation of the cable route above the MHWM will not have a direct impact on the European site being more than 2.6km to the SW of the Site. However, wading birds and waterfowl listed as designated features have the potential to utilise areas of un-designated habitat for foraging and roosting which may be impacted. Whilst is not anticipated that the temporary disturbance would result in a marked change in prey or habitat availability for the designated features of the European site a Potential Significant Effect cannot be ruled out. Further consideration of this effect is provided in Section 3. No LSE in-combination with other plans and projects in relation to offshore activities. None of the potential effects for which no LSE is predicted

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				utilise areas of un-designated habitat for foraging and roosting which may be impacted. Whilst is not anticipated that the temporary disturbance would result in a marked change in prey or habitat availability a Potential Significant Effect cannot be ruled out. Further consideration of this effect is provided in Section 3. No LSE in relation to offshore activities. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels and other plant installing or maintaining the cable is low However, even should this occur, the geographic extent of any effect would be highly localised due to the dilution effect and control of potential pollution events. This would not result in any LSE on. The designated features of the European site.	for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European sites or the wider populations of these species. They are of a scale (both spatially and temporally) that additive effects (i.e. in-combination) will not occur. No other plans or projects have been identified that would lead to in-combination effects
Ballycotton Bay SPA - 004022	12	NPWS (2012m): Qualifying Interests potentially within the ZoI of identified effects	Reduction in prey availability due to habitat change, suspended sediment or survey,	No LSE. The European Site features a number of species which would not be impacted by the proposed works due to the	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Non-breeding populations of: • Common Gull • Lesser Black-backed Gull Other Qualifying Interests included in site conservation objectives Non-breeding populations of: • Teal • Ringed Plover • Golden Plover • Grey Plover • Lapwing • Black-tailed Godwit *Limosa limosa* • Bar-tailed Godwit • Curlew • Turnstone *Arenaria interpres* • Wetland and Waterbird assemblage	construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	distance between localised effects and the European Site. Common gull and lesser black-backed gull are highly mobile species that forage over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of common gull or lesser black-backed gull (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore	for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	would lead to in-combination effects.
Cork Harbour SPA - 004030	21	NPWS (2012n): Qualifying Interests potentially within the ZoI of identified effects Non-breeding populations of: • Cormorant *Phalacrocorax carbo* • Common Gull • Black-headed Gull • Lesser Black-backed Gull • Oystercatcher *Haematopus ostralegus*	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food	No LSE in relation to landfall and onshore construction and installation Temporary habitat loss associated with the landfall connection does not directly impact areas of Cork Harbour SPA (the closest point being 21km to the W). Whilst bird species present at the European Site during the non-breeding period have the potential to utilise areas of un-designated habitat for foraging and roosting the intertidal habitats at Redbern - Claycastle beach are not considered close enough to the SPA	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Curlew • Bar-tailed Godwit Other Qualifying Interests included in site conservation objectives Non-breeding populations of: • Little Grebe *Tachybaptus ruficollis* • Great Crested Grebe *Podiceps cristatus* • Grey Heron *Ardea cinereal* • Shelduck *Tadorna tadorna* • Wigeon • Teal • Pintail *Anas acuta* • Shoveler *Anas clypeata* • Red-breasted Merganser *Mergus serrator* Golden Plover • Grey Plover • Lapwing	chain or directly (e.g. oiling).	such that they provide *ex-situ* habitats for the species identified. Disturbance associated with construction and installation of the cable route at the landfall location will not have a direct impact on the European site being more than 21km to the W of the Site. No LSE in relation to offshore activities. Of the SCI features listed, only cormorant, black-headed gull, common gull and lesser black-backed gull would occur in offshore habitats and have any potential to be affected by the offshore elements of the cable route. Offshore, the cable route occupies a very small area of the seabed in comparison with the potential coverage of cormorant, common gull, lesser black-backed gull or black-headed gull (based on mean maximum foraging distance off these species). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation.	considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Dunlin • Black-tailed Godwit Redshank Tringa totanus Wetland and Waterbirds Assemblage • Breeding populations of: • Common Tern *Sterna hirundo*		The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels and other plant installing or maintaining the cable is low given the standard operating procedure for offshore and intertidal works. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect and control of potential pollution events. This would not result in any LSE on the designated features of the European Site.	
Cruagh Island SPA - 004170	31	NPWS (2012o): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: Manx Shearwater *Puffinus puffinus* Other Qualifying Interests included in site conservation objectives Non-breeding populations of: Barnacle Goose *Branta leucopsis*	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through	No LSE. The European Site features species which would not be impacted by the proposed works (Barnacle Goose) due to the distance between localized effects and the European Site. Manx Shearwater are highly mobile species that forage over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
			bioaccumulation in the food chain or directly (e.g. oiling).	seabed and intertidal area in comparison with the potential foraging range of common gull or lesser black-backed gull (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However,	When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	
Helvick Head to Ballyquin SPA - 004192	75	NPWS (2012p): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Cormorant • Herring Gull *Larus argentatus* • Kittiwake *Rissa tridactyla* Other Qualifying Interests included in site conservation objectives Peregrine falcon Falco peregrinus • Chough *Pyrrhocorax pyrrhocorax*	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The European Site features species which would not be impacted by the proposed works (peregrine falcon and chough) due to the distance between localized effects and the European Site. Cormorant, herring gull and kittiwake are mobile species that forage over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of cormorant, herring gull and kittiwake (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation.	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.
Saltee Islands SPA - 004002	84	NPWS (2012q): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of:	Reduction in prey availability due to habitat change, suspended sediment or survey,	No LSE. The European Site features species which would not be impacted by the proposed works (cormorant, shag, herring gull, guillemot or razorbill) due	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Fulmar Gannet Morus bassanus • Lesser Black-backed Gull • Kittiwake • Puffin *Fratercula arctica* Other Qualifying Interests included in site conservation objectives • Cormorant • Shag • Herring Gull • Guillemot *Uria aalge* • Razorbill *Alca torda*	construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	to the distance between localized effects and the European Site. Fulmar, gannet, lesser black-backed gull, kittiwake and puffin are mobile species that forage over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of fulmar, gannet, lesser black-backed gull, kittiwake and puffin (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore	Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	
The Bull and The Cow Rocks SPA - 004066	101	NPWS (2012r): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Storm petrel • Gannet Other Qualifying Interests included in site conservation objectives Breeding populations of: • Puffin	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food	No LSE. The European Site features species which would not be impacted by the proposed works (puffin) due to the distance between localized effects and the European Site. Storm petrel and gannet are mobile species that forage over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
			chain or directly (e.g. oiling).	range of storm petrel and gannet, (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly	considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				localised due to the dilution effect. This would not result in any LSE on seabirds.	
Wexford Harbour and Slobs SPA - 004076	102	NPWS (2012ah): Qualifying Interests potentially within the ZoI of identified effects Non-breeding populations of: • Lesser Black-backed Gull Other Qualifying Interests included in site conservation objectives Non-breeding populations of: • Little Grebe • Great Crested Grebe • Cormorant • Grey Heron • Bewick's Swan *Cygnus columbianus bewickii* • Whooper Swan *Cygnus* • Light-bellied Brent Goose *Branta bernicla hrota* • Shelduck • Wigeon	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The European Site features numerous species which would not be impacted by the proposed works (the non-breeding assemblage of waterbirds) due to the distance between localized effects and the European Site. Lesser black-backed gull is a mobile species that forages over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of lesser black-backed gull, (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation.	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Teal • Mallard *Anas platyrhynchos* • Pintail • Scaup *Aythya marila* • Goldeneye *Bucephala clangula* • Red-breasted Merganser • Hen Harrier *Circus cyaneus* • Coot *Fulica atra* • Oystercatcher • Golden Plover • Grey Plover • Lapwing • Knot • Calidris canutus • Sanderling • Dunlin • Black-tailed Godwit • Bar-tailed Godwit		Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Redshank • Black-headed Gull • Little Tern • Greenland White-fronted Goose *Anser albifrons flavirostris* • Wetland and Waterbirds assemblage			
Mid-Waterford Coast SPA - 004193	104	NPWS (2012s): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Herring Gull Other Qualifying Interests included in site conservation objectives Breeding populations of: • Cormorant • Peregrine • Chough	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The European Site features species which would not be impacted by the proposed works (cormorant, peregrine and chough) due to the distance between localized effects and the European Site. Herring gull is a mobile species that forages over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of herring gull, (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
Beara Peninsula SPA - 004155	118	NPWS (2012t): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of; • Fulmar[8] Other Qualifying Interests included in site conservation objectives Breeding populations of: • Chough	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The European Site features species which would not be impacted by the proposed works (chough) due to the distance between localized effects and the European Site. Fulmar is a highly mobile species that forages over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of fulmar, (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route)

[8] All breeding seabirds that are features of SPAs have been considered both during inside and outside of the breeding season. This is in light of the Biologically Defined Minimum Population Scales published by Natural England (2015)

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.
Cliffs of Moher SPA - 004005	156	NPWS (2012u): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Fulmar Other Qualifying Interests included in site conservation objectives	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli.	No LSE. The European Site features species which would not be impacted by the proposed works (kittiwake, guillemot, razorbill, puffin and chough) due to the distance between localized effects and the European Site. Fulmar is a highly mobile species that forages over wider	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Breeding populations of: • Kittiwake • Guillemot • Razorbill • Puffin • Chough	Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of fulmar, (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or	or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	
Puffin Island SPA - 004003	175	NPWS (2012v): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Herring Gull Other Qualifying Interests included in site conservation objectives Breeding populations of: • Cormorant • Peregrine • Shag	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The European Site features species which would not be impacted by the proposed works (cormorant, peregrine and shag) due to the distance between localized effects and the European Site. Herring gull is a highly mobile species that forages over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of herring gull, (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
Magharee Islands SPA - 004125	177	NPWS (2012w): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Storm Petrel Other Qualifying Interests included in site conservation objectives Breeding populations of: • Shag • Common Gull • Common Tern • Arctic Tern • Little Tern *Sterna albifrons* Non-breeding populations of: • Barnacle Goose	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The European Site features species which would not be impacted by the proposed works (shag, common gull, common tern, Arctic tern, little tern and barnacle goose) due to the distance between localized effects and the European Site. Storm petrel is a highly mobile species that forages over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of storm petrel, (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.
Blasket Islands SPA - 004008	182	NPWS (2012x): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Fulmar • Manx Shearwater • Storm Petrel	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli.	No LSE. The European Site features species which would not be impacted by the proposed works (shag, lesser black-backed gull, herring gull, kittiwake, , Arctic tern, razorbill, puffin and chough) due to the distance between localized effects and the European Site. Fulmar, Manx shearwater and storm petrel are highly mobile species that forages over	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Other Qualifying Interests included in site conservation objectives Breeding populations of: • Shag • Lesser Black-backed Gull • Herring Gull • Kittiwake • Arctic Tern Sterna paradisaea • Razorbill • Puffin • Chough	Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of fulmar, Manx shearwater and storm petrel, (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the	or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	
Skelligs SPA - 004007	183	NPWS (2012y): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Fulmar • Manx shearwater • Storm petrel • Gannet Other Qualifying Interests included in site conservation objectives Breeding populations of; • Kittiwake • Guillemot	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The European Site features species which would not be impacted by the proposed works (kittiwake, guillemot and puffin) due to the distance between localized effects and the European Site. Fulmar, Manx shearwater, gannet and storm petrel are highly mobile species that forages over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of fulmar, Manx shearwater, gannet and storm petrel, (based on mean maximum foraging distance). The	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Puffin		disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds	the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects. .

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
High Island, Inishshark and Davillaum SPA - 004144	198	NPWS (2012z): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Fulmar Other Qualifying Interests included in site conservation objectives Breeding populations of: • Arctic Tern Non-breeding populations: • Barnacle Goose	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The European Site features species which would not be impacted by the proposed works (arctic tern and barnacle goose) due to the distance between localized effects and the European Site. Fulmar is a highly mobile species that forages over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of fulmar, (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.
Duvillaun Islands SPA - 004111	218	NPWS (2012aa): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Fulmar • Storm Petrel Other Qualifying Interests included in site conservation objectives	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including	No LSE. The European Site features species which would not be impacted by the proposed works (arctic tern and barnacle goose) due to the distance between localized effects and the European Site. Fulmar and storm petrel are highly mobile species that forage over wider distances and could potentially interact with the identified effects.	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Non-breeding populations of: • Barnacle Goose	hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of fulmar and storm petrel, (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and	When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	
Kerry Head SPA - 004189	221	NPWS (2012ab): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Fulmar Other Qualifying Interests included in site conservation objectives Non-breeding populations of: • Chough	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The European Site features species which would not be impacted by the proposed works (chough) due to the distance between localized effects and the European Site. Fulmar is a highly mobile species that forages over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of fulmar, (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation.	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.
Stags of Broad Haven SPA - 004072	224	NPWS (2012ac): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of:	Reduction in prey availability due to habitat change, suspended sediment or survey,	No LSE. The European Site features species which would not be impacted by the proposed works (storm petrel) due to the distance between localized effects	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Leach's storm petrel *Oceanodroma leucorhoa* Other Qualifying Interests included in site conservation objectives Breeding populations of: • Storm Petrel	construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	and the European Site. Leach's storm petrel is a highly mobile species that forages over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of Leach's storm petrel, (based on maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population.	Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	
Lambay Island SPA - 004069	225	NPWS (2012ad): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Fulmar Other Qualifying Interests included in site conservation objectives Breeding populations of: • Cormorant • Shag • Lesser Black-backed Gull • Herring Gull	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The European Site features numerous species which would not be impacted by the proposed works (breeding seabird assemblage and non-breeding greylag goose and herring gull) due to the distance between localized effects and the European Site. Fulmar is a highly mobile species that forages over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of fulmar, (based on mean	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Kittiwake • Guillemot • Razorbill • Puffin Non-breeding populations of: • Greylag Goose *Anser anser* • Herring Gull		maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This	designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				would not result in any LSE on seabirds.	
Deenish Islands and Scariff Island SPA - 004175	241	NPWS (2012ae): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Fulmar • Manx Shearwater • Storm Petrel Other Qualifying Interests included in site conservation objectives Breeding populations of: • Lesser Black-backed Gull • Arctic Tern	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The European Site features numerous species which would not be impacted by the proposed works (Arctic tern and lesser black-backed gull) due to the distance between localized effects and the European Site. Fulmar, Manx shearwater and storm petrel are highly mobile species that forage over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of fulmar, Manx shearwater and storm petrel (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route)

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.
Iveragh Peninsula SPA - 004154	266	NPWS (2012af): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of:	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise.	No LSE. The European Site features numerous species which would not be impacted by the proposed works (peregrine falcon, kittiwake, guillemot and chough) due to the distance between localized	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Fulmar Other Qualifying Interests included in site conservation objectives Breeding populations of: • Peregrine falcon • Kittiwake • Guillemot • Chough	Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	effects and the European Site. Fulmar is a highly mobile species that forages over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of fulmar, (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population.	considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSE on seabirds.	
Clare Islands SPA - 004136	284	NPWS (2012ag): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Fulmar Other Qualifying Interests included in site conservation objectives Breeding populations of: • Shag • Common Gull • Kittiwake • Guillemot	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The European Site features numerous species which would not be impacted by the proposed works (shag, common gull, kittiwake, guillemot, razorbill and chough) due to the distance between localized effects and the European Site. Fulmar is a highly mobile species that forages over wider distances and could potentially interact with the identified effects. The cable route and proposed landfall occupies a very small area of the seabed and intertidal area in comparison with the potential foraging range of fulmar, (based on mean	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Razorbill • Chough		maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during construction (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit, no change to the fitness of an individual bird would be predicted and therefore there would be no implications to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This	designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				would not result in any LSE on seabirds.	
Grassholm SPA – UK9014041	155	CCW (2008): Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Gannet	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The cable route occupies a very small area of the seabed in comparison with the potential coverage of any of gannet from Grassholm (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during installation (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit no change to the fitness of an individual bird would be predicted and therefore there would be no challenge to the conservation objectives relating to the SPA population.	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low given the standard operating procedure for offshore works. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSEs on seabirds.	along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.
Skomer, Skokholm and the seas off Pembrokeshire SPA UK9014051	103	CCW (2008a) Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Manx shearwater • Storm petrel • Puffin • Lesser black-backed gull Other Qualifying Interests included in site conservation objectives	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food	No LSE. The cable route occupies a very small area of the seabed in comparison with the potential coverage of any of the designated features from Skomer, Skokholm and the seas off Pembrokeshire (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during installation (even allowing for the temporary suspension of sediments) or operation.	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Breeding populations of: • Chough • Short – eared owl • Seabird assemblage of international importance	chain or directly (e.g. oiling).	Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit no change to the fitness of an individual bird would be predicted and therefore there would be no challenge to the conservation objectives relating to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low given the standard operating procedure for offshore works. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSEs on seabirds	considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.
Isles of Scilly SPA - UK9020288	103	Natural England (2019)o Qualifying Interests potentially within the ZoI of identified effects	Reduction in prey availability due to habitat change, suspended	No LSE. The cable route occupies a very small area of the seabed in comparison with	No LSE in-combination with other plans and projects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Breeding populations of: • Lesser black-backed gull • Storm petrel Other Qualifying Interests included in site conservation objectives • Seabird assemblage during the breeding season supporting storm petrel, shag, lesser black-backed gull and great black-backed gull	sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	the potential coverage of any of the designated features from the Isles of Scilly (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during installation (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit no change to the fitness of an individual bird would be predicted and therefore there would be no challenge to the conservation objectives relating to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low given the	None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				standard operating procedure for offshore works. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSEs on seabirds.	would lead to in-combination effects.
St Kilda SPA – UK9001031	649	NatureScot (2021) Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Manx shearwater Other Qualifying Interests included in site conservation objectives Breeding populations of: • Fulmar • Gannet • Great skua • Kittiwake • Leach's storm petrel • Manx shearwater • Puffin • Razorbill	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The cable route occupies a very small area of the seabed in comparison with the potential coverage of Manx shearwater from St Kilda (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during installation (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit no change to the fitness of an individual bird would be predicted and therefore there would be no challenge to the	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Storm petrel		conservation objectives relating to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low given the standard operating procedure for offshore works. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSEs on seabirds.	pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.
Rum SPA – UK9001341	559	NatureScot (2021a) Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Manx shearwater Other Qualifying Interests included in site conservation objectives Breeding populations of: • Golden eagle • Guillemot	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food	No LSE. The cable route occupies a very small area of the seabed in comparison with the potential coverage of Manx shearwater from Rum (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during installation (even allowing for the temporary suspension of sediments) or operation.	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Kittiwake • Red-throated diver • Seabird assemblage	chain or directly (e.g. oiling).	Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit no change to the fitness of an individual bird would be predicted and therefore there would be no challenge to the conservation objectives relating to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low given the standard operating procedure for offshore works. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSEs on seabirds.	Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.
Copeland Islands SPA – UK9001341	342	NIEA (2015) Qualifying Interests potentially within the ZoI of identified effects	Reduction in prey availability due to habitat change, suspended	No LSE. The cable route occupies a very small area of the seabed in comparison with	No LSE in-combination with other plans and projects.

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		Breeding populations of: • Manx shearwater Other Qualifying Interests included in site conservation objectives Breeding populations of: • Arctic tern	sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	the potential coverage of Manx shearwater from the Copeland Islands (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during installation (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit no change to the fitness of an individual bird would be predicted and therefore there would be no challenge to the conservation objectives relating to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low given the	None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				standard operating procedure for offshore works. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSEs on seabirds.	would lead to in-combination effects.
Irish Sea Front SPA – UK9020328	264	JNCC (2016) Qualifying Interests potentially within the ZoI of identified effects Breeding aggregations of: • Manx shearwater	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	No LSE. The cable route occupies a very small area of the seabed in comparison with the potential coverage of any of Manx shearwater from the Irish Sea Front (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during installation (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit no change to the fitness of an individual bird would be predicted and therefore	No LSE in-combination with other plans and projects. None of the potential effects for which no LSE is predicted for the Proposed Development alone are considered likely to affect the fitness of the designated features of the European site or the wider populations of the identified species. When the UK and French elements of the Celtic Interconnector are considered in-combination the overall effects on the designated features will not alter as the disturbance of the seabed will be temporary and is not expected to result in a marked change in prey availability, disturbance, and

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				there would be no challenge to the conservation objectives relating to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low given the standard operating procedure for offshore works. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSEs on seabirds.	pollution effects will not act in-combination (i.e. as the cable lay vessel will progress along the cable route) making the effects focused on a single locus at any one time. No other plans or projects have been identified that would lead to in-combination effects.
Baie de Morlaix SPA – FR5310073	314	Qualifying Interests potentially within the ZoI of identified effects Breeding populations of: • Storm petrel Other Qualifying Interests included in site conservation objectives Breeding populations of: • Lesser black-backed gull • Herring gull	Reduction in prey availability due to habitat change, suspended sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through	No LSE. The cable route occupies a very small area of the seabed in comparison with the potential coverage of any storm petrel from the Baie de Morlaix (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during installation (even allowing for the temporary suspension of sediments) or operation.	

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
		• Great black-backed gull • Roseate tern • Common tern • Sandwich tern • Cormorant • Shag	bioaccumulation in the food chain or directly (e.g. oiling).	Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit no change to the fitness of an individual bird would be predicted and therefore there would be no challenge to the conservation objectives relating to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and litter) from the vessels installing or maintaining the cable is low given the standard operating procedure for offshore works. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSEs on seabirds.	
Mers Celtiques - Talus du golfe de	195	Qualifying Interests potentially within the ZoI of identified effects	Reduction in prey availability due to habitat change, suspended	No LSE. The cable route occupies a very small area of the seabed in comparison with	

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
Gascogne SPA - FR5212016		Concentrations during the breeding and passage period of: • Fulmar • Gannet • Leach's storm petrel • Manx shearwater • Storm petrel	sediment or survey, construction or operational maintenance noise. Disturbance / displacement due to aural and visual stimuli. Direct toxic effects of pollutants including hydrocarbons through bioaccumulation in the food chain or directly (e.g. oiling).	the potential coverage of any fulmar, gannet, Leach's storm petrel, Manx shearwater or storm petrel from the Mers Celtiques - Talus du golfe de Gascogne SPA (based on mean maximum foraging distance). The disturbance to the seabed will be temporary and is not expected to result in a marked change in prey availability in the locality either during installation (even allowing for the temporary suspension of sediments) or operation. Presence (including noise and human activity) may result in an individual bird changing flight path. However, given the large distances covered, the presence throughout this area of other shipping and the highly localised behavioural change that this may elicit no change to the fitness of an individual bird would be predicted and therefore there would be no challenge to the conservation objectives relating to the SPA population. The freeing of contaminated sediments is not predicted given the location of the cable route away from port areas or anchorages. The risk of the loss of pollutants (including hydrocarbons and	

Site name	Distance (km)	Designated features	Potential effects of the project	LSE for the project alone	LSE for the project when in combination with other plans and projects
				litter) from the vessels installing or maintaining the cable is low given the standard operating procedure for offshore works. However, even should this occur the geographic extent of any effect would be highly localised due to the dilution effect. This would not result in any LSEs on seabirds.	

2.7 Screening Outcome

The plan or project is not directly connected with or necessary to the management of the site as a European Site and it cannot be excluded, on the basis of objective scientific information following screening, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on the following European sites.

- Ballymacoda Bay SPA (1.7km from landfall point) and
- Blackwater Estuary SPA (2.4km from landfall point)

For these sites, the following LSEs have been identified:

- habitat loss / degradation resulting in reduction in prey availability and roosting/resting habitat for wintering birds;
- visual/aural disturbance resulting in a reduction of availability of prey and roosting/resting habitat for wintering birds; and

The identified effects are not predicted to impact gull species, which are listed features of these European Sites. Common gull, lesser black-backed gull and black-headed gull are highly tolerant of human presence and their ability to forage over large distances ensures that any exclusion from construction areas would represent only a small part of their respective foraging ranges.

In addition, likely significant effects have been identified on the following European Sites in respect of the potential disturbance and auditory damage of marine mammals caused by underwater noise creation and the potential for death or injury due to collision with vessels:

Irish European sites:

- Lower River Shannon SAC
- Saltee Islands SAC
- Roaring water Bay and Islands SAC
- Blasket Islands SAC
- Rockabill to Dalkey Island SAC
- West Connacht Coast SAC
- UK European sites:
- Isles of Scilly complex SAC
- Bristol Channel Approaches / Dynesfeydd Mor Hafren SAC
- Pembrokeshire Marine / Sir Benfro Forol SAC
- West Wales marine / Gorllewin Cymru Forol SAC
- Cardigan Bay / Bae Ceredigion SAC
- Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC
- North Anglesey Marine / Gogledd Mon Forol SAC
- North Channel SAC
- French European Sites:
- ZSC Anse Goulven – Dunes de Keremma
- ZSC Abers – Côtes des Légendes
- ZSC Baie de Morlaix

- ZSC Talus du Golfe de Gascogne

3 Natura Impact Statement

3.1 Summary of screening outcome

Likely Significant Effects could not be excluded for three European sites at AA Screening stage. These are Ballymacoda Bay SPA and Blackwater Estuary SPA which are 1.7km and 2.4km from the proposed landfall installation site respectfully. For each of the European sites, the following LSEs have been identified:

- habitat loss / degradation resulting in reduction in prey availability and roosting/resting habitat for wintering birds as a result of construction activities at the Landfall location; and
- visual/aural disturbance resulting in a reduction of availability of prey and roosting/resting habitat for wintering birds as a result of construction activities at the Landfall location.

In addition, likely significant effects have been identified on the following European Sites in respect of the potential disturbance and auditory damage of marine mammals caused by underwater noise creation and the potential for death or injury due to collision with vessels:

Irish European sites:

- Lower River Shannon SAC
- Saltee Islands SAC
- Roaring water Bay and Islands SAC
- Blasket Islands SAC
- Rockabill to Dalkey Island SAC
- West Connacht Coast SAC

UK European sites:

- Isles of Scilly complex SAC
- Bristol Channel Approaches / Dynesfeydd Mor Hafren SAC
- Pembrokeshire Marine / Sir Benfro Forol SAC
- West Wales marine / Gorllewin Cymru Forol SAC
- Cardigan Bay / Bae Ceredigion SAC
- Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC
- North Anglesey Marine / Gogledd Mon Forol SAC
- North Channel SAC

French European Sites:

- •ZSC Anse Goulven – Dunes de Keremma
- ZSC Abers – Côtes des Légendes
- ZSC Baie de Morlaix
- ZSC Talus du Golfe de Gascogne

3.2 Ornithology baseline – background information

Ballymacoda Bay SPA and Blackwater Estuary SPA are 1.7km and 2.4km from the proposed installation site at Claycastle Beach. Whilst direct impacts have been ruled out, mobile Special Conservation Interest (SCI) species

associated with these sites have the potential to utilise un-designated ex-situ habitat that supports the designated features for some part of their life cycle.

Table 3.1 provides a description and summary of the designated features associated with these two European sites.

Table 3.1 Description of designated features of Ballymacoda Bay SPA (NPWS, 2012k) and Blackwater Estuary SPA (NPWS, 2012l)

Site Name	Description	Special Conservation Interest (SCI)
Ballymacoda Bay SPA	Ballymacoda Bay SPA supports over 20,000 waterbirds during the non-breeding season, making it a site of international importance. It is the second most important site for wintering waterfowl on the south coast after Cork Harbour. The site has internationally important numbers of Black-tailed godwit and Lesser black-backed gull and is the most important site in the country for Lesser black-backed gull during autumn. The site provides both feeding and roosting areas for the waterfowl species and habitat quality for most of the estuarine habitats is very good.	All non-breeding populations: • Bar-tailed Godwit Black-headed Gull • Black-tailed Godwit Common Gull • Curlew • Dunlin • Golden Plover • Grey Plover • Lapwing • Lesser black-backed Gull • Redshank • Ringed Plover • Sanderling • Teal • Turnstone • Wigeon Other Features • Wetlands NPWS (2012k)

Site Name	Description	Special Conservation Interest (SCI)
Blackwater Estuary SPA	The Blackwater Estuary is of high ornithological importance for wintering waterfowl, providing good quality feeding areas for a diversity of waterfowl species. At high tide, the birds roost along the shoreline and saltmarsh fringe. The site supports an internationally important population of black-tailed godwit. It supports a further eight species in numbers of national importance: shelduck; wigeon; golden plover; lapwing; dunlin; curlew; redshank and greenshank.	All non-breeding populations: • Bar-tailed godwit • Black-tailed godwit • Curlew • Dunlin • Golden plover • Lapwing • Redshank • Wigeon Other Features • Wetlands NPWS (2012l)

Further information regarding the status of the non-breeding populations at these sites is provided in Table 3.2 and Table 3.3 below.

Table 3.2 Special Conservation Interest (SCI) species of Ballymacoda Bay SPA – Current Site Conservation Condition (Taken from NPWS 2014a with supporting documents (Gilbert *et al* 2021, Irish Wetland Bird Survey Site Summary Tables)

Special Conservation Interest	BoCCI category*	Site population trend (1995/96 – 2009/10)	I-WeBS 5-year peak mean from 2013/14 – 2017/18**	Site conservation condition (as per NPWS 2014a)	Current all Ireland trend*	Current international trend***
Bar-tailed Godwit	Red	+28	255	Favourable	Declining	Increasing
Black-headed Gull	Amber	-73	471	Highly Unfavourable	Declining	n/c
Black-tailed Godwit	Red	+207	527	Favourable	Declining	Increasing
Common Gull	Amber	-91	168	Highly Unfavourable	n/c	n/c
Curlew	Red	-51	260	Highly Unfavourable	Declining	Declining
Dunlin	Red	-55	842	Highly Unfavourable	Declining	Stable/Declining
Golden Plover	Red	-39	4,412	Unfavourable	Declining	Declining
Grey Plover	Red	-15	126	Intermediate	Declining	Declining
Lapwing	Red	-61	456	Highly Unfavourable	Declining	Declining
Lesser Black-backed Gull	Amber	-85	1,427	Highly Unfavourable	Declining	n/c
Redshank	Red	+1	119	Favourable	Declining	Stable/Fluctuating
Ringed Plover	Amber	-7	103	Intermediate (Unfavourable)	Declining	Declining/Stable
Sanderling	Green	+111	76	Favourable	Stable	Stable
Teal	Amber	+29	240	Favourable	Declining	Increasing?
Turnstone	Amber	+7	64	Favourable	Declining	Increasing
Wigeon	Amber	-16	314	Intermediate (Unfavourable)	Declining	Declining?

* Updated using Glibert *et al* (2021), Birds of Conservation Concern in Ireland 2020-2026. Irish Birds 43: 1-22

** Taken from Site Summary Table for OL401 Ballymacoda (https://birdwatchireland.ie/our-work/surveys-research/research-surveys/irish-wetland-bird-survey/)

***Updated international trends cross referenced using Wetlands International (2021). "Waterbird Population Estimates" . Retrieved from wpe.wetlands.org on Monday 1 Mar 2021

Table 3.3 Special Conservation Interest (SCI) species of Blackwater Estuary SPA – Current Site Conservation Condition (Taken from NPWS 2012ai) with supporting documents (Gilbert *et al* 2021, Irish Wetland Bird Survey Site Summary Tables)

Special Conservation Interest	BoCCI category*	Site population trend (1997/98-2006/07)	I-WeBS 5-year peak mean from 2013/14 – 2017/18**	Site conservation condition (as per NPWS 2014a)	Current all Ireland trend	Current international trend**
Bar-tailed Godwit	Red	+28	39	Favourable	Declining	Increasing
Black-tailed Godwit	Red	+163.2	643	Favourable	Declining	Increasing
Curlew	Red	-28.3	691	Unfavourable	Declining	Declining
Dunlin	Red*	-74.3	192	Highly Unfavourable	Declining	Stable/Declining
Golden Plover	Red	-2.2	85	Intermediate (Unfavourable)	Declining	Declining
Lapwing	Red	-24.3	446	Intermediate (Unfavourable)	Declining	Declining
Redshank	Red	+16.6	294	Favourable	Declining	Stable/Fluctuating
Wigeon	Amber	-51.4	623	Highly Unfavourable	Declining	Declining?

* Updated using Glibert *et al* (2021), Birds of Conservation Concern in Ireland 2020-2026. Irish Birds 43: 1-22

** Taken from Site Summary Table for OL401 Ballymacoda (https://birdwatchireland.ie/our-work/surveys-research/research-surveys/irish-wetland-bird-survey/)

**Updated international trends cross referenced using Wetlands International (2021). "Waterbird Population Estimates" . Retrieved from wpe.wetlands.org on Monday 1 Mar 2021

The European sites support a range of different wetland birds with a number of species common to all three sites occurring in numbers of national and international significance.

Many of the SCI populations were experiencing declines in population on a site basis at all three European sites as highlighted in Tables 3.2-3.4. This is based on data taken from supporting information (NPWS 2012ai and NPWS 2014a) for each site. A review of summary data from the Ireland Wetland Bird Survey and national population trends (Gilbert *et al* 2021) suggests that these ongoing trends are likely to have continued with many of the species experiencing large declines in non-breeding numbers on national scale

At both national and site-level, with the exception of non-breeding gull populations and some non-breeding wader and duck species (namely sanderling and teal) the majority of SCI populations of Ballymacoda Bay SPA and Blackwater SPA are declining nationally.

3.2.1 Wintering Bird Surveys

Across all surveys and the two seasons of survey, 22 wetland bird species were recorded in total. Table 3.4 provides a list of species (with peak counts) occurring within the ZoI which are also SCIs of Ballymacoda Bay SPA or Blackwater Estuary SPA. Summary results for each year with all species are provided in Appendix A.

The proposed working area required for the landfall point at Claycastle Beach (as presented in the project description) is approximately 14m wide, and therefore occupies only a small proportion of the survey area. The proposed landfall locations is centred approximately on the boundary between count sections 3 and 4. Based on the ZoI defined in Table 2.4 (from Cutts *et al* 2009) birds which recorded in Sections 3 and 4 are at risk of disturbance. Birds recorded in other sectors could be as much as 1.5km from predicted disturbance sources and therefore outside of the defined ZoI.

Sanderling, a SCI of Ballymacoda Bay SPA, were the only species recorded in the ZoI occurring in numbers in excess of the 1% threshold for national importance with a peak count of 159 individuals recorded in March 2020 representing 1.88% of the all-Ireland population of this species.

During the wetland bird survey, sanderling numbers were distributed between the different count sectors occurring predominantly in count sections 1, 2 and 3. The peak count recorded during the intertidal surveys, a count of 84 birds at low-tide in December 2019, included a count of 38 individuals foraging in sector 3, the section that overlaps the proposed landfall location. The other birds recorded during this count included 8 birds in sector 1 and 38 birds in sector 2.

A single count of 50 sanderling was also made in November 2019 during the high-tide survey with the birds occurring in sector 3. The overall peak count of 159 birds was recorded during the nearshore surveys in March 2020 with the birds recorded foraging in the immediate vicinity of the proposed landfall. During the 2020/2021 surveys, sanderling numbers were very low within the ZoI with peak counts of 3 and 1 birds recorded in November and December respectively. During 2020/2021 sanderling were concentrated in count section 1 with a peak count of 254 birds in October 2020 and counts in excess of 100 in bother November 2020 (105 birds) and March 2021 (155 birds)

Other species occurring in notable numbers within count sections 3 and 4, and therefore within the ZoI of the installation included ringed plover, an SCI of Ballymacoda Bay SPA. A single count of 20 ringed plover was recorded at high tide in November 2019.

The other SCIs occurring within sections 3 and 4 were recorded in low numbers or infrequently with species including black headed gull, dunlin and cormorant all occurring in counts of ten or fewer individuals.

Outside of count sections 3 and 4 only bar-tailed godwit occurred in notable numbers. Peak counts of bar-tailed godwit were recorded during the 2020-2021 surveys with 335 Bar-tailed godwit were recorded in January 2021 representing 2% of the all-Ireland population of this species[9]. However the only records of bar-tailed godwit in

[9] When considering the relative importance of a site for a specific bird species, a threshold of 1% of a reference population is used to identify sites that support nationally or internationally important numbers taking into account the relevant national (in this case all-Ireland population) or international (in this case NW European) populations.

2019/20 and 2020/21 both occurred in count sector 1 which is between 700m and 1,200m south-west of the proposed landfall location.

Curlew, an SCI of both Ballymacoda Bay SPA and Blackwater Estuary SPA were recorded during surveys, with peak counts of up to 85 individuals, however these records were all restricted to inshore agricultural fields located behind the beach and are therefore considered to be outside of the ZoI for the effects listed. Further consideration of effects above the MHWM are considered in Volume 6A and as part of the in-combination assessment.

In summary, the SCI species present in significant numbers within the ZoI of the Project are restricted to sanderling and ringed plover (both SCIs of Ballymacoda Bay SPA). Other species which occurred in notable numbers were only recorded outside of the ZoI and therefore no impacts are predicted on these species.

Where nationally or internationally important populations occur regularly, this can be used to identify and designate sites of national (NHAs) or international importance (SPAs).

Table3.4: Peak monthly counts within ZoI (count Sectors 3 and 4) of SCI species at Redbarn-Claycastle (beach, sea and fields across all three bird survey seasons. H=High tide; L=Low tide; S =At Sea). Significant counts in bold text.

Species	Birds of Conservation Concern Status[10]	SCI of Ballymacoda SPA	SCI of Blackwater Estuary SPA	Peak within ZoI	Figure of National Significance	Peak as % of Figure of National Significance (Rounded to whole number)
Black-headed gull	Amber	✓	-	7 (HT)	None published as gulls not routinely counted	Not known but insignificant given small numbers present within ZoI as a proportion of likely gull population sizes
Common gull	Amber	✓	-	10 (LT)	None published as gulls not routinely counted	Not known but insignificant given small numbers present within ZoI as a proportion of likely gull population sizes
Dunlin	Red	✓	✓	1 (H)	460	<<1% and insignificant
Great black-backed gull	Green	-	-	4 (LT)	None published as gulls not routinely counted	Not known but insignificant given small numbers present within ZoI as a proportion of likely gull population sizes
Lesser black backed gull	Amber	✓	-	4(L)	None published as gulls not routinely counted	Not known but insignificant given small numbers present within ZoI as a proportion of likely gull population sizes
Ringed plover	**Amber**	✓	**-**	**20 (H)**	**120**	**17%**
Sanderling	**Green**	✓	**-**	**159 (H) [during marine surveys]**	**85**	**187%**

[10] Gilbert, G., Stanbury, A., Lewsi, L. 2021 Birds of Conservation Concern in Ireland 4: 2020-2026. Irish Birds 43: 1–22 .

3.3 Impact Prediction

3.3.1 Impact on European Sites – Blackwater Estuary SPA

Of the species listed as SCIs for Blackwater Estuary SPA, only bar-tailed godwit and curlew were recorded in notable numbers within the survey area. However, the recorded distribution of these birds has shown that this species did not occur within the ZoIs for installation activities, favouring areas of the coastline >700m from proposed working areas.

Therefore, it is concluded that the offshore element of the Proposed Development alone will not adversely affect the integrity of Blackwater Estuary SPA.

3.3.2 Impact on European Sites – Ballymacoda Bay SPA

Whilst direct impacts on Ballymacoda Bay SPA will not occur due to the distance between the proposed works and the European Sites, the beach and intertidal habitats may provide ex-situ habitat (NPWS 2012k) supporting the non-breeding bird assemblages associated with the European site. As outlined in the conservation objectives for these sites *"assessments that are examining factors that have the potential to affect the achievement of the site's conservation objectives should also consider the use of these 'ex-situ' habitats and their significance to listed bird species"*.

A peak count of 159 sanderling (representing 1.88% of the all-Ireland population[11] (Burke *et al* 2019)) was one of two instances where sanderling were recorded within the ZoI of the Proposed Development. A single record of 20 ringed plover also recorded within the ZoI, whilst only this represents less that 0.1% of all-Ireland population, this could represent a significant proportion of the SCI population occurring at Ballymacoda Bay SPA.

It is not possible to conclude definitively if these birds were associated specifically with the European Site, using the beach at Claycastle as alternative habitat, however, taking a precautionary approach, this has been assumed for the purposes of the assessment. Adverse effects to site integrity are considered in Section 3.3.5.

3.3.3 Ex-Situ Habitat loss/degradation – Ballymacoda Bay SPA

During phase one of installation approximately 2,860m^2 of intertidal habitats which are required for the installation of the sheet pile cofferdam and temporary causeway.

Habitat loss for waterbirds in the intertidal zone would be temporary; the presence of undisturbed sediment immediately adjacent to the area affected by installation means that recolonisation will begin within the short-term. The affected area would be returned to its current state following the end of phase one but it could still be unavailable for up to 10 weeks during the non-breeding period with installation planned for October-April (Whilst the installation area will be re-instated, it is likely that the prey resources upon which wading birds are reliant will take longer to recolonise the substrate making it unsuitable for a longer period.

Records of birds from surveys completed in 2019/20 and 2020/21 indicate that wading birds favour the south-western end of the beach between Redbarn and Claycastle beach. All of the records of bar-tailed godwit for example occurred more than 700m from the proposed cable route. Sanderling were more widespread during the surveys with birds recorded in closer proximity to the proposed cable route. Records from count sectors one, two and three indicate that suitable habitat for sanderling was present throughout much of the survey area.

The surveys completed in 2019/20 and 2020/21 have shown that use of the intertidal areas is sporadic with numbers of wading birds varying between months with no species occurring in notable numbers for an extended part of the non-breeding period. However, the surveys suggest that wading birds already favour areas of similar habitat which is more than 200m away from the proposed cable route and associated installation areas with larger counts of wading birds occurring in section 1 of the survey

[11] When considering the relative importance of a site for a specific bird species, a threshold of 1% of a reference population is used to identify sites that support nationally or internationally important numbers taking into account the relevant national (in this case all-Ireland population) or international (in this case NW European) populations. Where nationally or internationally important populations occur regularly, this can be used to identify and /designate sites of national (NHAs) or international importance (SPAs).

If it is assumed that sanderling or ringed plover associated with Ballymacoda Bay SPA are using the intertidal habitats between Redbarn and Claycastle Beach as alternative habitat, it has been concluded that the temporary loss of habitat would not result in a long-term change in population trend or a significant decrease in range, timing or intensity of use throughout the wider area of distribution for this species. This is because the reduction in potential foraging area is small, does not form a regularly used area and therefore its temporary loss will not affect the fitness of individual birds, or therefore, the local population associated with the European Site.

3.3.4 Visual/aural disturbance during installation

During phase one (and to a lesser extent phase two) of installation, activities on the foreshore and presence of personnel have the potential to result in disturbance that would render the installation area and an additional buffer of 250m from disturbance sources (Cutts *et al* 2009) unsuitable for wading birds resulting in effective loss of habitat for a 10-week period during the installation phase. The peak of disturbance would be during the construction period of the cofferdam though human presence throughout could still result in disturbance within the defined ZoI.

As described above, the surveys completed in 2019/20 showed that birds generally favoured sections of the beach which are more than 200m from the proposed cable route with largest concentrations of waders occurring more than 700m away in section 1 of the survey area. Sanderling and ringed plover were recorded within the ZoI of the Proposed Development but are less sensitive to human disturbance than species such as bar-tailed godwit (Cutts et al., 2013). Sanderling were recorded foraging throughout the survey area with suitable foraging habitat available throughout. Records of ringed plover were restricted to a single occurrence of 20 individuals. The ZoI of the Proposed Development offers limited roosting habitats to sanderling or ringed plover, (i.e. localized sheltered areas above the HWM, free from human disturbance where birds rest, until feeding areas are re-exposed on a falling tide).

The surveys completed in 2019/20 and 2020/21 have shown that use of the intertidal areas is sporadic with numbers of wading birds varying between months with no species occurring in notable numbers for an extended part of the non-breeding period.

The temporary loss of habitat through disturbance would not result in a long-term change in population trend or a significant decrease in range, timing or intensity of use throughout the wider area of distribution. This is because the reduction in potential foraging area is small, does not form a regularly used area and therefore its temporary loss will not affect the fitness of individual birds, or therefore, the local population associated with the European Site.

3.3.5 Impacts on European Sites – SACs supporting marine mammals

A Likely Significant Effect on marine mammals due to noise disturbance and potential for collision with vessels was identified as tried and tested mitigation is required to ensure that effects on the fitness of individual animals and local populations is not realised. Although the Proposed Development does not intersect with any of the European sites listed, the mobile nature of marine mammals means that members of designated populations could be in an area within which noise disturbance is perceptible and vessels are operating. The species identified as potential impacted includes;

- Bottlenose dolphin;
- Harbour porpoise;
- Grey seal; and
- Common seal.

The full list of sites potentially effected is provided in Section 2.6 and 3.1.

Mitigation measures that will be implemented as part of the Proposed Development are:

- Proposed Development-related vessels to be operated in line with IMO Guidelines for the reduction of underwater noise to address adverse impacts on marine life;
- Operations in the UK marine environment will be undertaken in line with JNCC's 'Guidelines for minimising the risk of injury to marine mammals from geophysical surveys' (JNCC, 2017);

- Use of technology and techniques that limit noise propagation (in air and underwater).

The implementation of these actions is standard practice for marine development projects such as cable installations and offshore wind farms. Therefore, there is confidence that these measures are both able to be implemented and are effective at mitigating effects on individual animals and the local populations to which they belong.

The temporary loss of habitat through disturbance or impacts of collisions on individual cetaceans or seals would not result in a long-term change in population trend or a significant decrease in range, timing or intensity of use throughout the wider area of distribution. This is because the reduction in potential foraging area is small and therefore its temporary loss will not affect the fitness of individual cetaceans or seal. Similarly the likelihood of collision with vessels is reduced significantly by the mitigation measures implemented.

3.4 Potential for adverse effects on site integrity

3.4.1 Ballymacoda Bay SPA

The undesignated habitat between Redbarn and Claycastle is only used sporadically by non-breeding wetland birds. Counts varied significantly between months and there were few species which were present throughout the non-breeding season. The beach and intertidal area also experience moderate-high levels of human disturbance through dog walking and other recreational uses.

Ballymacoda Bay SPA has been identified as the 13th most important site in Ireland for Sanderling supporting an estimated baseline population of 98 individuals (1995/96 – 1999/00) (NPWS 2014). Analysis of population trends for this species, based on the Irish Wetland Bird Survey from 1995/96-2009/10, suggest numbers of sanderling at Ballymacoda Bay SPA have increased progressively during this period, consistent with the all-Ireland and international trends. The conservation status of sanderling is favourable at the European Site and assessed as stable for Ireland as a whole. Table 3.5 summarises the population trends and conservation status for Sanderling.

Table 3.5 Summary of sanderling and ringed plover population trends and conservation status (taken from NPWS 2014)

Special Conservation Interest	BoCCI category	Site population trend	Site conservation condition	Current all Ireland trend	Current international trend
Sanderling	Green	+111	Favourable	Stable	Increasing
Ringed plover	Amber	-7	Intermediate (Unfavourable)	Declining	Declining/Stable

The wider area includes considerable areas of intertidal and coastal habitat that is protected through statutory protection and includes sites such as Ballymacoda Bay SPA, Blackwater Estuary SPA, Ballycotton Bay SPA and Cork Harbour SPA that provide suitable habitat for sanderling and are within 20km of the Project. The surrounding coastline also provides significant areas of non-designated habitat which is also suitable for sanderling.

Given the short-term nature of the predicted effects (i.e. temporary habitat loss and disturbance during construction), the availability of other suitable habitat in the wider area, the observed distribution and counts of sanderling, it is concluded that the Project will not adversely affect the integrity of Ballymacoda Bay SPA or any other European sites.

3.4.2 SACs supporting marine mammals

Underwater noise and disturbance effects on marine mammals in the subtidal zone (all groups) are possible during the installation, operation and decommissioning phases as a result of subsea survey and use of monitoring equipment and vessel operation (potentially causing behavioural responses, masking, auditory injury and non-auditory injury). The assessment in Volume 4 Environmental Report for UK Offshore – Chapter 18:

Noise and Vibration indicates that the engines and dynamic positioning (DP) of vessels and cable installation activity (i.e. trenching, cable laying) that would be used during installation, operation and decommissioning phases produce noise levels that are below what is considered to be a threat to marine mammals (180dB). This is in line with the published literature that suggests vessel and installation noise is below levels that may alter the fitness of individual animals (Niras 2015, Natural Power 2018). However, the underwater noise source levels, from subsea survey and monitoring equipment would exceed the threshold over which mitigation for marine mammals would be necessary (240dB verses 180dB). Mitigation is required to avoid the potential for behavioural disturbance, auditory injury and non-auditory injury.

The mitigation measures described in Section 4.2 are commonly applied on marine projects (including cable installation projects) and eliminate or reduce the impacts to the extent where effects on individual animals or local populations can be discounted. Therefore, no adverse effect on the integrity of any of the European sites listed in Section 2.6 and 3.1 due to the production of underwater noise can be concluded.

Vessels can collide with marine mammals resulting in injury or death. However, collision with vessels is not considered to present a particular risk to marine mammals for the Proposed Development due to the moderate progress of the vessels laying cable (20 to 300m per hour dependent on substrate), their predictable path and the agility of the species in question. This aligns with the literature published on this issue – e.g. Palka & Hammond 2001. However, by implementing the mitigation within the guidelines described in Section 3.3.5 the risk can be negated. This ensures that there will be no adverse effects on the integrity of the project alone on any of the European sites listed in Section 2.6 and 3.1 due to the death or injury of marine mammals from collision with vessels.

3.5 In-Combination Assessment

3.5.1 Marine mammals

The potential for other plans and projects to act in-combination with the Proposed Development can be discounted. This is because the in-combination assessment has only identified other elements of the Celtic Interconnector project (i.e. in Irish and French waters) as potentially acting in-combination. As the cable installation progress is sequential and the mitigation measures described above will be applied in all jurisdictions no adverse effects on the integrity of the project in-combination with other plans and projects on any of the European sites listed in Section 2.6 and 3.1 can be concluded.

Wintering birds

Wintering bird surveys have shown that non-breeding SCI populations potentially associated with Ballymacoda Bay SPA and Blackwater Estuary SPA utilise areas of Claycastle beach, Ballyvergan Marsh, and adjoining coastal fields[12]. The occurrences of these species have been recorded above the MHWM, outside the ZoI of the offshore element of the Proposed Development. However, potential for significant effects to some of these non-breeding SCI populations have been predicted in Volume 6A Onshore Screening for Appropriate Assessment and Natura Impact Statement. This includes the following effects on each of the European Sites identified;

- Temporary disturbance/displacement effects due to noise and vibration; and
- Habitat degradation as a result of surface water pollution (Ballymacoda Bay SPA only).

If assumed that installation activities, both above and below the MHWM are taking place at the same time then there is potential for an in-combination effect on Ballymacoda Bay SPA and Blackwater Estuary SPA and as a result of increased noise and human presence. In Volume 6A it is concluded that following implementation of mitigation including noise-reducing hoarding, and low noise plant specifications, no adverse effects on SPA integrity are predicted with respect to disturbance.

Construction work associated with the onshore parts of the Proposed Development include excavation and construction associated with the cable route and other supporting infrastructure. As part of Volume 6A a potential effect related to surface water pollution, resulting in the release of concrete or other pollutants into the

[12] bar-tailed godwit (peak 335 on Claycastle Beach; count section 1), curlew (peak count of 85 birds in Ballyvergan marsh), teal (peak count of 26 birds in Ballyvergan Marsh), redshank (peak count 15 on Claycastle Beach; count section 1), dunlin (peak count of 115 birds at Claycastle count section 1).

hydrological network was identified. In order to prevent adverse effects on the European Sites integrity, specific mitigation measures have been identified relating to surface water protection which, if implemented, will ensure no adverse effects on SPA integrity with respect to surface water pollution.

UK and French elements of the Proposed Development

A Habitats Regulations Assessment (HRA) Screening assessment was produced for the UK (offshore) elements of the Project. This concluded that the potential for likely significant effects on the conservation objectives on an SPA sites (i.e. sites primarily designated for breeding seabird populations) designated by the UK, Ireland or France could be excluded for the Celtic Interconnector Project alone and in-combination with other plans and projects.

For SAC sites featuring mobile marine mammals as designated features (including grey seal, common seal, bottle-nose dolphin and harbour porpoise), LSEs were identified with respect to underwater noise and vessel movements were identified and consideration of mitigation and adverse effects on site integrity were required.

Mitigation measures to be implemented as part of the proposed development include the following;

- Proposed Development-related vessels to be operated in line with IMO Guidelines for the reduction of underwater noise to address adverse impacts on marine life;
- Operations in the Irish marine environment will be undertaken in line with JNCC's 'Guidelines for minimising the risk of injury to marine mammals from geophysical surveys' (JNCC, 2017);
- Use of technology and techniques that limit noise propagation (in air and underwater).

The implementation of these actions is standard practice for marine development projects such as cable installations and offshore wind farms. Therefore, there is confidence that these measures are both able to be implemented and are effective at mitigating effects on individual animals and the local populations to which they belong.

For the French elements of the Project, reporting to fulfil Article 6(3) of the Habitats Directive comprises a report (in French) entitled: 'Évaluation Des Incidences Natura 2000'. This report did not identify potential for likely significant effects on any European sites within the Irish jurisdiction, and concluded there would be no adverse effects on the integrity of any European sites, from the French elements of the Project alone, in combination with other plans or projects (including the Proposed Development).

3.5.2 Other Projects and plans - Offshore

The Offshore Renewable Energy Development Plan (OREDP) published in 2019 (OREDP 2019) has identified the need for sustainable development of offshore wind and tidal energy and examines three different scenarios for delivery of increasing amounts of offshore energy. Whilst this plan does not provide locations of potential sites it does consider the potential capacity of regional marine and coastal areas and further considers potential cumulative impacts with other existing projects in Irish Waters. Through a Strategic Environmental Assessment (SEA) and associated screening for impacts on environmental receptors (including fish, shellfish, marine mammals, seabirds and marine reptiles) and European Sites an assessment has been made by the Department of the Environment, Climate and Communications with regard to the potential impacts of a significant increase in offshore development in Irish waters.

Results of the SEA conclude that whilst there is potential to achieve the "higher level scenario" presented in the OREDP without significant adverse effects on the environment, this is only achieved with the inclusion of mitigation measures embedded into the planning and design phases to ensure sustainable development. As highlighted in the NIS that accompanies the OREDP, a number of European sites and species could be impacted by the levels of offshore development proposed by the plan. However the assessment highlights the need for further investigative work at an individual project level to adequately assess these impacts and highlights the need for developers to "comprehensively demonstrate at the project level that there would be no LSE on the integrity and conservation of objectives of a Natura Site". It further states that where developers are "unable to demonstrate that there would be no LSE developments would not be permitted unless IROPI was demonstrated". These requirements would therefore be built into any developments brough forward ensuring that where possible offshore developments minimise or avoid impacts on European sites and the species they support.

However, given the time that would be needed to develop the hypothetical capacity proposed in OREDP there would be no temporal overlap with the Proposed Development and therefore no in combination effects on European Sites.

Furthermore, given the temporary nature of the construction effects associated with the Proposed Development ; it is considered that effects would not occur in combination with other, already operational offshore developments.

Inis Ealga Marine Energy Park

This project relates to an offshore floating wind energy project off the coast of Cork which is at an early optioneering stage of development. There is an intersection between the submarine cable route of the Celtic Interconnector and the indicative installation corridor identified for the Inis Ealga Marine Park.

No indicative timeframe is available to determine whether works will run in parallel to the construction phase of the Celtic Interconnector project.

The onshore transmission connection proposals are not yet available. Following the design of substation, the project will be subject to the provisions of the Directive in its own right, i.e. requiring screening for Appropriate Assessment.

3.5.3 Other Projects and plans – Onshore

Volume 6A identifies the following current and future projects/developments which have been considered for in-combination effects with respect to the onshore element of the Proposed Development;

- Midleton to Youghal Greenway (Current)
- Lower Lee Flood Relief Scheme (Current)
- Midleton Carrigtohill WWTP Upgrade (Future)
- N25 Carrigtohill to Midleton Scheme (Future)
- Midleton Flood Relief Scheme (Future)
- Ballyadam 110kV Substation (Future)
- IDA lands at Ballyadam (Future)
- Urban Expansion Project (Future)
- Kilbarry Knockraha 110 kV Refurbishment (Future)

Environmental assessments completed for the two current projects, Midleton to Yougal Greenway and Lower Lee Flood Relief Scheme have concluded that both projects will have no significant impacts on and European Sites both alone or in-combination with other projects. Taking into consideration the nature of these projects and the distance from the Proposed Development, it is concluded that there would be no in-combination impacts associated with any part of the Celtic Interconnector Project (onshore or offshore).

For all future projects, it is assumed that the nature and location of the projects will be subject to the requirements of the EU Habitats Directive and will therefore required screening for Appropriate Assessment. Taking into consideration the proposed mitigation measures for the Proposed Development and the likely requirement of any future projects it is concluded that there would be no in-combination impacts associated with future projects.

3.6 Mitigation Measures

Mitigation measures to minimise any potential impact of the cable installation, both offshore and in the intertidal zone have been included within the design and installation methods described for the project. These include:

- Project-related vessels to be operated in line with IMO Guidelines for the reduction of underwater noise to address adverse impacts on marine life;
- Operations in the Irish marine environment to be undertaken in line with the ‘Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters’, as published by DAHG

(2014). This guidance recommends the use of MMOs for pre-start monitoring, ramp up procedure, breaks (>30 mins) in sound output and reporting;

- For the Proposed Development, different development activities have been assessed, including piling, geophysical acoustic surveys (not seismic), high frequency (>200kHz) bathymetric surveys, using multibeam and singlebeam echosounders, cable laying and cable protection. From these, and to be in line with this assessment and guidance (i.e. mitigation required >180dB and a ramp up procedure >170dB), an MMO (dedicated) is only required for piling and the geophysical acoustic surveys (not seismic). High frequency (>200kHz) bathymetric surveys, using multibeam and singlebeam echosounders, are above the low-mid hearing frequency ranges of marine mammals, basking shark, marine turtles, and fish. Cable laying and cable protection have been assessed as being below level that would require mitigation (<180dB). Also, the sound pressure levels are expected to be in the same range, as those from the installation vessels;
- DAHG (2014) guidance outlines operational requirements concerning MMOs. These requirements require MMOs to be familiar with the Irish regulatory procedures, be provided with full details of all licence/consent conditions, be dedicated to and engaged solely in monitoring development activities and conducting survey effort for marine mammals in accordance with the guidance. The use of a crew member or team member with other responsibilities is not considered to be satisfactory. A sufficient number of MMO personnel must be assigned to ensure that the role is performed effectively and to avoid observer fatigue. General conditions for effective visual monitoring by MMOs are: (1) during daylight hours; (2) in good visibility extending 1km or more beyond the limits of the assigned Monitored Zone (1,000m for piling and 500m for geophysical acoustic surveys, not seismic); and (3) sea conditions WMO Sea State 4 (*Beaufort Force 4*) or less. Efficacy in the visual detection of marine mammal species improves considerably below Sea State 3 (*Beaufort Force 3*);
- Unless otherwise agreed with the NPWS and/or the Foreshore Unit, MMOs must be located on an appropriate elevated platform from which the entire Monitored Zone (1,000m for piling and 500m for geophysical acoustic surveys, not seismic) can be effectively covered without any obstruction of view. For geophysical acoustic surveys and other moving platforms from which sound-producing activity is taking place, MMOs must be located on the source vessel;
- DAHG (2014) guidance also recommends that, in some cases involving the persistent significant risk of injury to marine mammals in Ireland, the supplementary use of passive acoustic monitoring (PAM) may be recommended, or required, as part of the licence/consent conditions, in order to optimise marine mammal detection around the site of a plan or project. It is also indicated that PAM has/should not be regarded as the primary or sole monitoring approach for risk management purpose. It was identified that for PAM be effective, animals are required to vocalise and their detection depends on the range capability of the technology. It should also be recognised that this was related to the method/technology that was available back in 2014;
- Use of noise-attenuation fencing, solid hoarding or other acoustic barriers to reduce in-air noise propagation and to conceal human activity. The barrier material shall have a mass per unit area exceeding 7kg/m^2 in accordance with the recommendations of BS 5228 Part 1:2009+A1:2014 Part B.4;
- Use of piling types and techniques that limit noise propagation: namely vibratory sheet piling installation and piling at low tide;
- Use of ramp up/soft start procedures for piling and geo acoustic survey techniques to prevent receptors from being startled e.g. birds, marine mammals, marine turtles, and fish (inc. basking shark);
- Project-related vessels will adhere to international best practise regarding pollution control, including the MARPOL convention;
- Ensure appropriate burial depths and heat shielding from cable burial and rock placement (where applicable). This will indirectly reduce effects from heat emissions and electro-magnetic fields (EMF);

- Works within the intertidal zone will be restricted in extent with contractors working within defined parameters and working areas. Working areas will be established during the setting out phase of the project and clearly defined to minimise impacts on non-breeding birds which use the beach and intertidal area at the proposed landfall location;
- All construction access to the beach will follow designated access and egress routes to ensure that impacts to habitats are minimised during the installation phase;
- The sheet piling required for construction of the cofferdam, will be completed following best practice to minimise noise impacts. Full details will be provided in a Construction Code of Practice document to be adopted by the project but may include measures such as restricting timing and duration of piling activities or the use of aural screening to minimise the extent of noise;
- All works areas (including staging areas and site compounds) have been designed to be located outside of Annex 1 habitats (such as sand dunes); and
- All works will be completed following standard operating measures to minimise risk of pollution, as outlined within the CEMP and other project documentation.

4 Summary Statement

Potential environmental changes that could result from the installation and operational phases of the Proposed Development have been considered to determine whether LSE on European sites can be excluded on the basis of objective information; from the Proposed Development individually, or in-combination with other plans or projects (including other elements of the Celtic Interconnector Project). The following potential environmental changes were identified:

1. Habitat damage / degradation of ex-situ habitats outside European sites (including from smothering);
2. Disturbance or displacement of marine mammals, migratory fish or birds;
3. Reduction in foraging efficiency/success of marine mammals, migratory fish or birds;
4. Collision of marine mammals with vessels;
5. Pollution events (including disturbance of polluted sediments, pollutant escape from vessels and marine litter); and
6. Barriers to the movement of migratory fish.

The AA screening process concluded that Likely Significant Effects on European sites cannot be excluded for the Proposed Development alone, or in-combination with other plans or projects for the Ballymacoda Bay SPA and the Blackwater Estuary SPA. However, further assessment within the NIS has led to the conclusion that the Proposed Development will not, either alone, or in-combination with other plans or projects, adversely affect the integrity of any European sites in light of their conservation objectives. Therefore, there will be no adverse effects on the integrity of any European sites, from the Proposed Development alone, or in combination with other plans or projects

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Appendix A – Summary results from wintering bird surveys completed between 2019 and 2021

Table A1 A summary of wintering bird survey information gathered at Redbarn – Claycastle Beach between February and March 2019

Species	**High Tide Peak (Counts from sectors three and four, i.e. within ZoI in parentheses)**	**Low Tide Peak (Counts from sectors three and four, i.e. within ZoI in parentheses)**	**Birds of Conservation Concern (BoCC) in Ireland**	**All Ireland Population**	**Figure of National Significance (Burke *et al* 2018)**	**Peak as % of figure of national significance** (within full survey area)
Grey Heron (Ardea cinerea)	0 (0)	1 (0)	Green	2,610	105	0.9%
Cormorant (Phalacrocoracidae)	1 (0)	0 (0)	Amber – B&W	10,870	110	0.9%
Oystercatcher (Haematopus Ostralegus)	14 (0)	29 (14)	Amber – B&W	60,540	610	4%
Curlew (Numenius)	57 (0)	16 (0)	Red – B&W	35,240	350	33%
Bar-tailed godwit (Limosa Lapponica)	0 (0)	6 (0)	Amber - W	16,530	170	3.5%
Sanderling (Calidris alba)	0 (0)	88 (25)	Green	8,420	85	103%
Redshank (Tringa totanus)	0 (0)	1 (0)	Red – B&W	23,800	240	0.41%
Black-headed gull (Chroicocephalus ridibundus)	4 (0)	22 (9)	Red - B	None published as gulls not	Not available	Not known but likely to be insignificant

Species	**High Tide Peak (Counts from sectors three and four, i.e. within ZoI in parentheses)**	**Low Tide Peak (Counts from sectors three and four, i.e. within ZoI in parentheses)**	**Birds of Conservation Concern (BoCC) in Ireland**	**All Ireland Population**	**Figure of National Significance (Burke *et al* 2018)**	**Peak as % of figure of national significance** (within full survey area)
				routinely surveyed		given small numbers within ZoI
Common gull **(Larus canus)**	14 (4)	15 (1)	Amber - B	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant given small numbers within ZoI
Great black-backed gull **(Larus marinus)**	0 (0)	8 (0)	Amber - B	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant given small numbers within ZoI
Herring gull **(Larus argentatus)**	0 (0)	23 (4)	Red - B	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant given small numbers within ZoI
Lesser black-backed gull **(Larus fuscusl)**	0 (0)	4 (4)	Amber - B	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant given small numbers within ZoI

Table A2 A summary of the wintering bird survey information gathered at Redbarn – Claycastle Beach between November 2019 and March 2020

Species	**High Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Low Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Birds of Conservation Concern (BoCC) in Ireland**	**All Ireland Population**	**Figure of National Significance (Burke *et al* 2018)**	**Peak as % of figure of national significance** (within full survey area)
Mute swan (Cygnus olor)	0 (0)	5 (0)	Green	9,130	90	5.5%
Mallard (Anas platyrhynchos)	0 (0)	2 (0)	Green	28,230	280	0.7%
Teal (Anas crecca)	26 (0)	15 (0)	Amber – B&W	35,740	360	7%
Eider (Somateria)	2 (0)	0 (0)	Amber – B&W	5,660	55	3.6%
Cormorant (Phalacrocorax carbo)	1 (1)	3 (0)	Amber – B&W	10,870	110	2.7%
Shag (Phalacrocorax aristotelis)	17 (0)	5 (0)	Amber – B	Not available	Not available	Not known but likely to be insignificant given small numbers within ZoI
Little egret (Egretta garzetta)	3 (0)	3 (0)	Green	1,390	20	15%

Species	**High Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Low Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Birds of Conservation Concern (BoCC) in Ireland**	**All Ireland Population**	**Figure of National Significance (Burke *et al* 2018)**	**Peak as % of figure of national significance** (within full survey area)
Grey heron (Ardea cinerea)	1 (0)	0 (0)	Green	2,610	25	4%
Water rail (Rallus aquaticus)	0 (0)	1 (0)	Green	Not available	Not available	Not known but likely to be insignificant given small numbers within ZoI
Oystercatcher (Haematopus Ostralegus)	42 (38)	13 (8)	Amber – B&W	60,540	610	6.9%
Grey plover (Pluvialis squatarola)	0 (0)	1 (0)	Amber - W	2,940	30	3.3%
Ringed plover (Charadrius hiaticula)	20 (20)	0 (0)	Green	11,660	120	16.7%
Sanderling (Calidris alba)	50 (50)	84 (38)	Green	8,420	85	98.8%
Turnstone (Arenaria)	1 (0)	0 (0)	Green	9,480	95	1.1%

Species	**High Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Low Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Birds of Conservation Concern (BoCC) in Ireland**	**All Ireland Population**	**Figure of National Significance (Burke *et al* 2018)**	**Peak as % of figure of national significance** (within full survey area)
Dunlin **(Calidris alpine)**	1 (0)	0 (0)	Red – B&W	45,760	460	0.2%
Redshank **(Tringa totanus)**	1 (0)	2 (0)	Red – B&W	23,800	240	0.8%
Bar-tailed godwit **(Limosa lapponica)**	0 (0)	152 (0)	Amber - W	16,530	170	89.4%
Curlew **(Numenius)**	76 (0)	85 (0)	Red – B&W	35,240	350	24.3%
Black-headed gull **(Chroicocephalus ridibundus)**	4 (2)	18 (5)	Red - B	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant given small numbers within ZoI
Common gull **(Larus canus)**	15 (12)	31 (3)	Amber - B	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant given small numbers within ZoI

Species	**High Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Low Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Birds of Conservation Concern (BoCC) in Ireland**	**All Ireland Population**	**Figure of National Significance (Burke *et al* 2018)**	**Peak as % of figure of national significance** (within full survey area)
Herring gull **(Larus argentatus)**	9 (4)	52 (9)	Red - B	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant given small numbers within ZoI
Great black-backed gull **(Larus marinus)**	6 (4)	6 (0)	Amber - B	None published as gulls not routinely surveyed		Not known but likely to be insignificant give small numbers present within ZoI

Table A3 A summary of the wintering bird survey information gathered at Redbarn – Claycastle Beach between October 2020 and March 2021

Species	**High Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Low Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Birds of Conservation Concern (BoCC) in Ireland**	**All Ireland Population**	**Figure of National Significance (Burke *et al* 2018)**	**Peak as % of figure of national significance** (within full survey area)
Brent Goose **(Branta bernicla)**	0 (0)	3 (0)	Amber - W	35,150	350	0.86

Species	**High Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Low Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Birds of Conservation Concern (BoCC) in Ireland**	**All Ireland Population**	**Figure of National Significance (Burke *et al* 2018)**	**Peak as % of figure of national significance** (within full survey area)
Mute swan (Cygnus olor)	2 (0)	6 (0)	Green	9,130	90	6.67
Mallard (Anas platyrhynchos)	0 (0)	6 (0)	Green	28,230	280	2.14
Teal (Anas crecca)	3 (0)	20 (10)	Amber – B&W	35,740	360	5.56
Cormorant (Phalacrocorax carbo)	0 (0)	9 (1)	Amber – B&W	10,870	110	8.18
Little egret (Egretta garzetta)	1 (0)	4 (0)	Green	1,390	20	20.00
Oystercatcher (Haematopus ostralegus)	16 (1)	27 (26)	Amber – B&W	60,540	610	4.43
Grey plover (Pluvialis squatarola)	0 (0)	10 (0)	Amber - W	2,940	30	33.33
Ringed plover (Charadrius hiaticula)	0 (0)	14 (0)	Green	11,660	120	11.67
Sanderling	0 (0)	254 (3)	Green	8,420	85	298.82

Species	**High Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Low Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Birds of Conservation Concern (BoCC) in Ireland**	**All Ireland Population**	**Figure of National Significance (Burke *et al* 2018)**	**Peak as % of figure of national significance** (within full survey area)
(Calidris alba)						
Turnstone (Arenaria)	4 (0)	5 (0)	Green	9,480	95	5.26
Dunlin (Calidris alpine)	0 (0)	115 (0)	Red – B&W	45,760	460	25.00
Redshank (Tringa totanus)	0 (0)	15 (0)	Red – B&W	23,800	240	6.25
Bar-tailed godwit (Limosa lapponica)	0 (0)	335 (0)	Amber - W	16,530	170	197.06
Black-tailed godwit (Limosa limosa)	35 (0)	0 (0)	Red – W	19,800	200	17.50
Curlew (Numenius)	32 (0)	113 (0)	Red – B&W	35,240	350	32.29
Black-headed gull (Chroicocephalus ridibundus)	7 (7)	360 (8)	Red - B	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant give small numbers present within ZoI

Species	**High Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Low Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Birds of Conservation Concern (BoCC) in Ireland**	**All Ireland Population**	**Figure of National Significance (Burke *et al* 2018)**	**Peak as % of figure of national significance** (within full survey area)
Mediterranean gull (Ichthyaetus melanocephalus)	0 (0)	1 (0)	Amber – B	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant give small numbers present within ZoI
Common gull (Larus canus)	4 (2)	85 (2)	Amber - B	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant give small numbers present within ZoI
Herring gull (Larus argentatus)	5 (5)	25 (10)	Red - B	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant give small numbers present within ZoI
Lesser black-backed gull (Larus fuscus)	0 (0)	3 (0)	Amber – B&W	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant give small numbers present within ZoI

Species	**High Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Low Tide Peak (Counts from sectors three and four, i.e. within ZoI, in parentheses)**	**Birds of Conservation Concern (BoCC) in Ireland**	**All Ireland Population**	**Figure of National Significance (Burke *et al* 2018)**	**Peak as % of figure of national significance** (within full survey area)
Great black-backed gull **(Larus marinus)**	6 (0)	3 (1)	Amber - B	None published as gulls not routinely surveyed	Not available	Not known but likely to be insignificant give small numbers present within ZoI
Sandwich Tern **(Thalasseus sandvicensis)**	0 (0)	2 (0)	Amber – B	Non-breeding estimated not available. Estimated 2,519 breeding pairs in Ireland.[13]	50	4%

[13] Cummins *et al* (2020) The Status of Ireland's Breeding Seabirds: Birds Directive Article 12 Reporting 2013 -2018 Irish Wildlife Manual 114