MOTT MACDONALD

EIRGRID

Volume 6A Onshore Screening for Appropriate Assessment and Natura Impact Statement

Celtic Interconnector

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Contents

1 Introduction

1.1 Overview of Celtic Interconnector Project

The Project will provide a link to transfer electrical energy between the electrical transmission grids in Ireland and France. The link will have the capacity to carry up to 700MW of electrical energy between the two systems.

The transmission grids in both Ireland and France are operated at High Voltage Alternating Current (HVAC). High Voltage Direct Current (HVDC) is used for the transmission of electrical power over large distances where HVAC is not technically or economically feasible.

Converter stations are therefore required in both France and Ireland to convert the HVDC power to HVAC.

The main elements of the Celtic Interconnector Project ('The Project') are:

- A submarine circuit between Claycastle Beach in Youghal, County Cork connecting approximately 497 kilometres (km) in length of submarine cable between the Ceinture Dorée (Gold Belt) coast in Brittany France and Ireland;
- A landfall point, where the submarine circuit will come onshore and terminate at a transition joint bay, to the north of the car park at Claycastle Beach.
- An underground HVDC cable between the landfall point at Claycastle Beach and the converter station compound at Ballyadam, east of Carrigtwohill.
- A converter station compound at Ballyadam which will convert the electricity from HVAC to HVDC and vice versa.
- An underground HVAC cable between Ballyadam and the connection point to the grid (Knockraha substation).
- A connection to the Irish National Grid at Knockraha substation in County Cork.

A fibre optic cable will also be laid along the entire route for operational control, communication and telemetry purposes.

1.2 Irish Onshore (Land) Elements of the Project

Reporting has been developed to fulfil the requirements of Article 6(3) of the EU Habitats Directive 92/43/EEC ('The Habitats Directive') for each jurisdiction within which infrastructure is proposed as part of the Project.

This Appropriate Assessment Screening and Natura Impact Statement assesses the effects on European sites of the Irish land-based elements of the Project (down to, and including the High Water Mark), in combination with other plans or projects, including Irish Project elements below the High Water Mark, Irish elements offshore, elements in the UK Exclusive Economic Zone, and French elements of the Project.

Reporting to fulfil Article 6(3) requirements from other Project elements, in combination with other plans and projects is respectively provided in:

- Volume 6B for Irish project elements below the High Water Mark, and Irish elements offshore;
- Volume 11 for Project elements in UK waters; and,

- Volume 6 for French based elements of the Project.

Volume 6C presents an overarching summary document, to gather the conclusions of Article 6(3) reporting across jurisdictions, and report on effects on European sites from the Project in its entirety.

1.3 Requirement for Appropriate Assessment

1.3.1 European Law

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora ('the Habitats Directive') is European Community legislation regarding nature conservation.

The Habitats Directive requires that where a plan or project is likely to have a significant effect on a European site (s), (and where the plan or project is not directly connected with or necessary to the nature conservation management of the European site), the plan or project will be subject to 'Appropriate Assessment' (AA) to identify any implications for the European site(s) in view of the site's Conservation Objectives. Specifically, Article 6(3) of the Habitats Directive states:

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

Case law of the European Court of Justice (ECJ) has refined the conditions requiring AA under Article 6(3). Specifically, case law has determined that AA is required, if likely significant effects cannot be excluded on the basis of objective information. Case law has also clarified that measures intended to avoid or reduce harmful effects on European sites, when carrying out AA Screening.

1.3.2 Irish Law

In the context of the proposed development, the Habitats Directive is transposed into Irish law by the Part XAB of the Planning and Development, 2000 S.I. 30/2000 (as amended) ('The Planning Acts'), and the Planning and Development Regulations 2001 as amended ('The Planning Regulations').

Under Section 177U (1) of the Planning Acts, a Screening for AA of the proposed development shall be carried out by the competent authority (in this case, An Bord Pleanála) to assess in view of best scientific knowledge, if that proposed development, individually or in combination with other plans or projects, is likely to have a significant effect(s) on any European sites.

Under Section 177U (5) of the Planning Acts, the competent authority (in this case, An Bord Pleanála) shall determine that an AA of a proposed development is required if it *cannot be excluded* [emphasis added], on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site(s).

AA is the process provided for under Article 6 (3) of the Habitats Directive to determine whether a project or plan could 'adversely affect the integrity' of any European sites, either alone or in-combination with other plans or projects, in light of the conservation objectives of the European sites in question.

Under Section 177V (1), (1) An appropriate assessment..*shall include a determination by the competent authority under Article 6.3 of the Habitats Directive as to whether or not a draft Land use plan or proposed development would adversely affect the integrity of a European site*

Under Section 177V (2), the competent authority (in this case, An Bord Pleanala) shall, in carrying out an appropriate assessment under subsection (1*), take into account each of the following matters:*

a. the Natura impact report or Natura impact statement, as appropriate;
b. any supplemental information furnished in relation to any such report or *statement;*
c. if appropriate, any additional information sought by the authority and furnished *by the applicant in relation to a Natura impact statement;*
d. any additional information furnished to the competent authority at its request in relation to a Natura impact report;
e. any information or advice obtained by the competent authority;
f. if appropriate, any written submissions or observations made to the competent authority in relation to the application for consent for proposed development;

1.4 Definitions

1.4.1 European sites and features

A network of European sites of conservation importance has been identified by each Member State, hosting habitats and/or species identified in the Directives as needing to be either maintained at or returned to 'favourable conservation status'.

The sites of conservation importance known as European sites comprise the Natura 2000 network. In Ireland, European sites comprise areas designated as Special Areas of Conservation (SACs) and/or Special Protection Areas (SPAs). The process of designating cSACs as SACs is ongoing in Ireland. Candidate sites (In Ireland, comprising cSACs) have the same legal protection as those whose designation is complete.

The designation features of SACs are referred to as Qualifying Interests (QIs), and these comprise both species (excluding birds), and habitats.

The designation features of SPAs are referred to as Special Conservation Interests (SCIs), and these comprise bird species, as well as wetland bird habitats.

The designation features of European sites are identified in the Statutory Instruments for European sites where such sites have completed the designation process. In all cases, designation features are also identified in Conservation Objectives published by the NPWS. Any Conservation Objectives referred to in this NIS are referenced to identify the date of publication and version number.

1.4.2 Favourable Conservation Status

Article 1 of the Habitats Directive states that favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and

- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

Article 1 of the Habitats Directive states that the favourable conservation status of a species is achieved when:

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

1.4.3 Natura Impact Statement

Under Section 177T of the Planning Acts (177T), a Natura Impact Statement (NIS) is defined as:

"A statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites".

The NIS must "include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites".

1.5 Structure of this Report

The findings of this assessment are documented in this report. The structure of this report includes the following elements:

- Chapter 2: Screening for Appropriate Assessment
  - Section 2.1 Management of the European site(s)
  - Section 2.2 Overview of the Proposed Development
  - Section 2.3 Characteristics of the European site(s)
  - Section 2.4 Assessment of Significance
  - Section 2.5 Screening Outcome
- Chapter 3: Natura Impact Statement
  - Section 3.1 Summary of Screening Outcome
  - Section 3.2 Description of the Proposed Development
  - Section 3.3 Description of European Site
  - Section 3.4 Impact Prediction
  - Section 3.5 Potential for Adverse Effects on Site Integrity
  - Section 3.6 Mitigation

1.6 Methodology

This report has been prepared in accordance with the following European Commission Guidance:

- EC (2018) Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC Commission Notice C (2018) 7621
- DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities (Revised 2010).

This report has similarly been prepared with regard to relevant rulings by the ECJ, and the Irish courts.

1.6.1 Desktop Data

This assessment includes a desk-based review of available records of protected species and habitats including the following sources:

- Backing Documents and Maps prepared in accordance with Article 17 of the Habitats Directive;
- European site documentation including Conservation Objectives, NPWS Site Synopses and, Natura Standard Data Forms, and available from National Parks and Wildlife Service (NPWS);
- Published and unpublished NPWS reports on protected habitats and species including Irish Wildlife Manual reports, and
- Existing relevant mapping and databases e.g. waterbody status, species and habitat distribution etc. (sourced from the Environmental Protection Agency - http://gis.epa.ie/, the National Biodiversity Data Centre - http://maps.biodiversityireland.ie and the National Parks and Wildlife Services - http://www.npws.ie/mapsanddata/,

1.6.2 Field Survey Data

Walkover Surveys

Field surveys were carried out subject to landowner agreement. Walkover surveys of the landfall site, cable route, and converter station were conducted on 29 May 2019, and on the following dates in 2020: 26 August, 1 September, 8 September, 9 September, 29 September, 6 October, 7 October, 8 October, 13 October, 14 October, 27 November and 4 December.

Habitat and plant surveys of the entirety of the proposed development were carried out by Mott MacDonald, with bespoke specialist botanical surveys carried out by Dr John Conaghan of BES within the Converter Station site and wider Ballyadam / IDA site only.

Where access allowed close inspection, habitats in all areas were classified to level three according to the scheme outlined in “A Guide to Habitats in Ireland”[1]

Fit to European Annex 1 habitats was informed with reference to the EU Interpretation Manual for EU Habitats (European Commission, 2013) having regard to the Irish Vegetation Classification[2] where possible.

Habitat survey methods had regard to ‘*Best Practice Guidance for Habitat Survey and Mapping*’ (Smith et al., Heritage Council, 2011).

During site walkovers searches for Invasive species listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011), as amended, was conducted.

[1] Fossitt, J., (2007) A Guide to Habitats in Ireland. The Heritage Council of Ireland Series. ISSN 1393 – 68 08

[2] ERICA - Biodiversity Ireland

Bespoke field surveys were not conducted for a variety of Annex II species who are absent from the ZoI of the proposed development, either because suitable habitats were absent, or because the species have restricted distributions and are known not to occur. These species, for which field surveys were not required, included:

- Lesser horseshoe bat *Rhinolophus hipposideros,* whose populations are restricted to the western Atlantic seaboard, and whose nearest occurrence is 35 km west of the proposed development site;
- Freshwater pearl mussel *Margaritifera margaritifera,* because the proposed development does not occur within any of the known catchments for the species identified by the NPWS
- Marsh fritillary *Euphydryas aurinia*, since bespoke habitat surveys for the Project confirmed absence of the larval foodplant *Succisa pratensis* within the footprint and environs of the proposed development;
- Kerry slug *Geomaculosus maculosus,* whose distribution in Cork is restricted to the west of the County (NPWS, 2013).

Aquatic Surveys

A fisheries habitat appraisal of the watercourses in the footprint and downstream of the onshore cable route was undertaken to establish their importance for Atlantic salmon, lamprey, and other fish species. The baseline assessment considered the quality of spawning, nursery and holding habitat within the vicinity of the survey sites using Life Cycle Unit (salmonids) and Lamprey Habitat Quality Index (LHQI) scores (lamprey).

A broad appraisal / overview of the upstream and downstream habitat at each aquatic survey site was also undertaken to evaluate the wider contribution to salmonid and lamprey spawning and general fisheries habitat. A summary of the findings as relevant to nearby European Sites is provided.

Wintering Bird Surveys

Wintering bird surveys consisted of:

- Wetland bird surveys at high and low tide, at Claycastle Beach in February and March 2019, and monthly from November 2019 to March 2020 (Figure 1.1),
- Marine bird surveys at Claycastle beach monthly from November 2019 to March 2020 (shown in yellow in Figure 1.1);
- Line-transect surveys at Ballyadam monthly from December 2019 to March 2020 (Figure 1.2; and,
- Wintering hen harrier surveys at Ballyvergan Marsh monthly in February and March 2019, and from November 2019 to March 2020

Commented [DH1]: **2020/2021 WINTERING BIRD SURVEY DATA TO BE ADDED FOR FINAL APPLICATION**

Figure 1.1: Redbarn-Claycastle Beach showing Ballyvergan marsh (brown) and the five count sections

Source: Nagle 2020

Figure 1.2: Wider Ballyadam/IDA site showing the winter bird survey transect (red line).

Source: Nagle 2019

1.7 Consultation

1.7.1 National Parks and Wildlife Services (NPWS)

1.7.1.1 16 December 2020

Written correspondence was sent to the Development Application Unit (DAU) for the attention of NPWS in November 2020 providing an overview of the proposed development and requesting any additional information on nature conservation and biodiversity within the receiving environment.

A response was received on 16 December 2020. The full response is provided in Appendix A The Department noted the following specific comments of relevance to the AA Screening and NIS:

- Most of the proposed development was away from any designated areas or areas of known conservation importance;
- The proposal to route the underground cable within existing public roads is welcomed as this reduces potential ecological impacts;
- Subject to …mitigation measures to be identified relating to the relocation and enhancement of habitat for scarce or rare plant species on the site [unrelated to AA considerations] this Department has, at this time, not identified any concerns that cannot be mitigated relating to the Ballyadam site;
- Subject to more detailed assessment at the application stage and the findings of the EIA and NIS, the Department is at this time satisfied that most of the terrestrial cable route is unlikely to cause significant ecological concern provided proper mitigation measures are implemented.

The Department also included in the response the following requests:

- That mitigation measures related to watercourses be incorporated to protect watercourses and associated species.

- That otters and bats be surveyed for at bridges and river crossings and impacts mitigated.
- That surplus materials derived from excavations be disposed of only at pre-approved licensed facilities.
- Due to concern about traversing the eastern edge of Ballyvergan Marsh pNHA for a section of up to approximately 200m in length, a full ecological assessment of the potential impacts at this location will need to be carried out and any negative impacts avoided or compensated for.
- It is noted that the proposed cable route passes adjacent to Lough Aderry and Ballybutler pNHA (sitecode 0446) and the EIA should assess any potential impacts to this site.
- The Department would recommend the cable route be contained within the existing road way to reduce any potential for negative effects
- That the potential for disturbance to wintering bird species be assessed.
- That a Natura Impact Statement document be included with application for consent.
- That an assessment on marine mammals be made as to the potential for interaction with marine mammals.

1.7.1.2 15 January 2020

A Webex meeting was held between EirGrid, EirGrid's Consultants, and the NPWS on the 15 January to further discuss the written request of 16 December 2020.

The following notable actions were observations/actions were recorded by EirGrid:

- NPWS queried whether the current Converter Station Site proposals for sealed tanked drainage could incorporate some element of open water wetland with the dual purpose of water storage and biodiversity

  EirGrid agreed to discuss with the design team, who subsequently advised on 19 January, that whilst open water was potentially feasible, the sealed system presented significant advantages over open water, in terms of available storage capacity within a given footprint.
- EirGrid confirmed an Ecological Clerk of Works would be appointed for the entire project.
- NPWS raised a historical concern with storage of excess fill, by third party landowners.

  EirGrid responded that such activities would be fully assessed, to ensure compliance with relevant waste legislation, and to protect sensitive areas.
- NPWS Marine specialist advised that impacts to marine mammals may be greatest in bays near Youghal. EirGrid confirmed a Marine Mammal Observer would be employed by the Contractor for the entirety of marine works.
- NPWS Marine specialist advised that noise modelling, not available at the time of the meeting, would need to inform marine environmental assessments including impacts to marine mammals.
- The potential impacts to, and mitigation and/or compensation for Ballyvergan marsh, were discussed. EirGrid advised that Cork County Council owned these lands and committed to exploring practical enhancement measures in the pNHA in the course of the planning application. Mitigation measures discussed included seasonal works, and reducing the footprint of the HDD launch and reception pits within the marsh:

1.7.2 Inland Fisheries Ireland (IFI)

A meeting was held with IFI on 14 January 2020. During the meeting the general development was outlined to IFI. During the meeting IFI noted the following:

- Horizontal Directional Drilling (HDD) would be preferential as it avoids instream works.
- Pearl mussel are unlikely to be a concern within the study area.
- Invasive species are in the area.
- There is currently no evidence of crayfish plague although this may change.

Written correspondence was sent to IFI in October 2020 including details of aquatic surveys carried out. IFI responded noting:

- HDD is preferential to open trenching.
- Any element of work requiring instream works should be limited to the fisheries open season.
- Where open trenching is proposed provision should be made for site restoration post work e.g. river bank stabilization and gravel replacements.

Written correspondence was sent to IFI in November 2020 providing an update on the Proposed Development and requesting any views that IFI might have in relation to the development. A response was received in December stating that IFI would assess the details of the proposed scheme at the planning stage.

1.7.3 Cork County Council

Consultation with Cork County council has been ongoing throughout the development of the project. Written correspondence was sent to Cork County Council in November 2020. This provided an update on the project and invited views on the proposals and the opportunity to discuss the content of the applications.

A response was received in December 2020 noting that a separate response would be issued in relation to the project. No further responses have been received to date.

A meeting was held between EirGrid, EirGrid's Consultants and the Ecology office of the Ecology Office of Cork County Council on the 18 February.

Commented [DH2]: **MEETING NOTES TO BE ADDED TO FINAL APPLICATION**

1.8 Limitations

Due to Covid-19, and limitations due to the associated restrictions, not all offline areas (i.e. area outside of the existing road curtilage) within the potential zone of influence have been subject to a walkover survey.

Areas where works are required outside of the road curtilage that could not be surveyed are outlined below in Table 1.1.

Table 1.1: Areas Not Accessed

Location	Features	Likely Habitats in footprint
Route Section AC01-AC02	Passing bay	Agricultural grassland
Route Section AC02-AC03	Offline section	Agricultural grassland
Route Section AC03-AC04	6 passing bays	Agricultural grassland
Route Section AC04-AC05	Passing bay	Agricultural grassland
Route section AC05 -AC06	6 passing bays	Amenity grassland and agricultural grassland
Route section AC06-AC07	Passing bay, Offline section Compound area	Agricultural grassland
Route section DC01-DC02	4 passing bays, and a laydown area	Agricultural grassland
Route Section DC02-DC03	4 passing bays, offline section laydown area	Agricultural grassland
Route section DC03 -DC04	2 passing bays	Agricultural grassland
Route section DC04 -DC05	3 passing bays, Offline section Laydown area	Agricultural grassland
Route section DC07-DC08	An offline section, Passing bay	Agricultural grassland
Route section DC09-DC10	Two temporary compounds for HDD crossing, One laydown area	Agricultural grassland

Based on aerial photography, and views from publicly accessible areas, inaccessible habitats within the footprint of the works are likely to comprise agricultural and amenity grassland. Both are low in terms of value to biodiversity and common in the wider landscape. As such, the information gathered during the field assessment is considered robust.

Surveys in the highest quality habitats (i.e. Ballyvergan Marsh, the proposed Converter station footprint within the wider Ballyadam/IDA site, and aquatic habitat surveys at watercrossings), and the Knockraha substation, were undertaken during the optimal season, and over two seasons. Surveys of the cable route took place outside of the optimal season for vegetative survey (i.e. surveys were carried out from October to December instead of the optimal April to September window), which was unavoidable due to a combination of covid-19, and third party land access restrictions.

Wintering bird surveys were conducted during the optimal season, in areas with potential to host significant populations of conservation interest (Claycastle, Ballyvergan, the proposed Converter Station site, and the wider Ballyadam / IDA site).

2 Screening for Appropriate Assessment

2.1 Management of European Sites

The Proposed Development is not directly connected with or necessary to the 'management' of European sites within the Natura 2000 Network having regard to Article 6 of the Habitats Directive. As such it is appropriate that the Proposed Development is subjected to screening for AA.

This screening assessment investigates, in view of best scientific knowledge, whether the Proposed Development, individually or in combination with other plans and projects, would be likely to have a significant effect on European sites. This report considers the likelihood of significant effects on European sites from the construction, operation of the Proposed Development.

2.2 Overview of the Proposed Development

The Celtic Interconnector is a subsea link that will enable the exchange of electricity between the electrical transmission grids in Ireland and France. The link will have the capacity to carry up to 700 MW of electrical energy between the two systems.

The transmission grids in both Ireland and France are operated at High Voltage Alternating Current (HVAC). High Voltage Direct Current (HVDC) is used for the transmission of electrical power over large distances where HVAC is not technically or economically feasible. Converter stations are therefore required in both France and Ireland to convert the HVDC power to HVAC.

The main elements of the Celtic Interconnector project are:

- A HVDC submarine cable of approximately 500 km in length laid between the Ceinture Dorée (Gold Belt) coast in Brittany France, and the Cork coast in Ireland. The submarine cable will be either buried beneath the seabed or laid on the seabed and covered for protection;
- A landfall location in Ireland and France, where the HVDC submarine circuit will come onshore and terminate at a transition joint bay;
- An HVDC underground cable (UGC) in both countries between the landfall location and a converter station compound;
- A converter station to convert the electricity from HVDC to HVAC and vice versa;
- A HVAC UGC in both countries between the converter station compound and the connection point to the National Grid; and,
- A connection to the National grid;

A fibre optic link, with associated power supply, will also be laid along the route for operational control, communication and telemetry purposes.

Figure 2.1: The Proposed DevelopmentFigure 2.1 below illustrates the main elements of the proposals.

Table 2.1: Route Sections provides a description of these locations. For ease of reference, the route section nomenclature detailed in Table 2.1 has been assigned to both the HVAC (AC) and HVDC (DC) routes between the connection point and the converter station (AC) and between

the converter station and the landfall interface area at Claycastle Beach (DC). These references are used throughout this document.

. Figure 2.1: The Proposed Development

Source: Mott MacDonald

Table 2.1: Route Sections

Route Section Name	Route Section Descriptor (and Townland)
Connection Point	Knockraha Substation (Ballynanelagh)
AC01-AC02	Knockraha Substation (Ballynanelagh) to east of Ballynanleagh (Killeena)
AC02-AC03	East of Ballynanleagh, west of T-Junction (Killeena) to East of Ballynanleagh, east of T-Junction (Killeena)
AC03-AC04	East of Ballynanleagh, east of T-Junction (Killeena) to Garranes crossroads (Garranes)
AC04-AC05	Garranes crossroads (Garranes) to south of Woodstock (Woodstock)
AC05-AC06	Woodstock (Woodstock)/Gortnamucky to north of Ballyadam (Ballyadam)
AC06-AC07	North of Ballyadam (Ballyadam) to Ballyadam (Ballyadam)
Converter Station Site	Ballyadam (Ballyadam)
DC01-DC02	Ballyadam (Ballyadam) to Carrigogna/R626 (Carrigogna)
DC02-DC03	Carrigogna (Carrigogna) to Ballyspillane East (Ballyspillane East)
DC03-DC04	Ballyspillane East (Ballyspillane East) to Roxborough (Roxborough)
DC04-DC05	Roxborough (Roxborough) to Churchtown North / N25 (Ballyedekin)
DC05-DC06	Churchtown North (Ballyedekin) to West of Castlemartyr (Killamucky)

Route Section Name	Route Section Descriptor (and Townland)
DC06-DC07	West of Castlemartyr (Killamucky) to East of Castlemartyr (Clasharinka)
DC07-DC08	East of Castlemartyr (Clasharinka) to West of Killeagh (Mountbell)
DC08-DC09	West of Killeagh (Mountbell) to east of Killeagh (Ballymakeagh More)
DC09-DC010	Killeagh (Ballymakeagh More) to N25/west of R634 (Ballyvergan West)
DC10-DC011	Ballyvergan West (Ballyvergan West) to R634 / R908 (Summerfield)
DC11-DC012	R634 / R908 (Summerfield) to north of Claycastle Beach car park (Summerfield)
Landfall Area	Transition Joint Bay (Summerfield) to HWM at Claycastle Beach (Summerfield)

2.2.1 Overview of Baseline Environment

A high-level description of the different sections of the Proposed Development and the habitats encountered therein is provided below in Table 2.2. The location references correspond to sections of the proposed cable route and are provided along with habitat maps of the proposed development in Appendix B.

Table 2.2: Habitat types within the Footprint of the Works

Location	Habitats Within Footprint of the Proposed Development
Knockraha Substation	• To the west of the substation the laydown area is located within existing hard standing (BL3) and scrub (WS1). • To the east of the existing substation (BL3), the footprint of the substation is within improved and managed agricultural grassland (GA1), and hedgerow habitat (WL1).
AC01-AC02	• Cable route is entirely within the road (BL3). • Passing bay footprint is within improved agricultural grassland (GA1) and hedgerow habitat (WL1).
AC02-AC03	• Cable route leaves the existing roadway (BL3), running along the edge of an agricultural grassland field (GA1). The cable route crosses two treelines (WL2) and enters into another field containing agricultural grassland (GA1). The route then re-enters the existing roadway.
AC03-AC04	• This long stretch of cable is entirely within the existing roadway (BL3). • Six passing bays are located adjacent to the roadway along this section. The passing bays are all located within improved agricultural grassland (GA1) bordered by hedgerows (WL1). • One crossing of a drainage ditch (FW4) is required.
AC04-AC05	• The cable is located entirely within the existing roadway (BL3). • Two passing bays are required along this section of the route. The first is located within agricultural field (GA1) with treeline border (WL2). • The second passing bay is located within an area of hazel dominated woodland (WN2) which has a stream (FW1) running parallel to the road. • One crossing of a drainage ditch (FW4) is required.
ACO5-AC06	• The cable route is located entirely within the existing roadway (BL3). • Three laydown areas are proposed within agricultural field (GA1) bordered by hedgerows (WL1). One laydown area (LDA-AC02) is bordered by a flowing drainage ditch. • Two crossings of drainage ditches (FW4) are required.
AC06-AC07	• The cable route runs within the existing road (BL3) before entering into agricultural grassland (GA1) to the south of the road and crossing the existing railway line (BL3). • A passing bay is located within the agricultural grassland (GA1) to the north of the existing road.
Converter Station Site	• The cable route passes through a bank of scrub (WS1) where it enters into the converter station site. • The converter station site is comprised of recolonising bare ground (ED3) transitioning into calcareous grassland (GS1), sparsely vegetated bare ground (ED2), scrub (WS1), and the existing internal roads (ED2). A small wetland feature is also present within the footprint of the converter site.

Location	Habitats Within Footprint of the Proposed Development
	• Further details in relation to the wider IDA site in which the converter station site is located, is provided below in section 8.5
DC01-DC02	• This long stretch of cable is located predominantly within the existing roadway (BL3). • The cable route exits the converter station through the bank of scrub (WS1) and crossing the railway line (BL3) through a field of agricultural grassland (GA1), and into the road. • The cable exits the road and crosses a hedgerow to enter a tillage field (BC3). The cable then crosses the Owenacurra river (FW1), a treeline (WL2) and enters into a field of agricultural grassland (GA1). • The cable route exits the field through the end of a treeline (WL2) and enters back into the existing road (BL3). • Five passing bays are located along this stretch of cable, all within agricultural grassland (GA1) bordered by hedgerows (WL1). • One laydown area is proposed within a field of agricultural grassland (GA1). • Three drainage ditches (FW4) require crossings
DC02-DC03	• The cable route exits the roadway through a treeline (WL2) and enters into an area of wet grassland (GS4) adjacent to the Owennacurra River (FW1). • The cable exits the wet grassland into an agricultural field (GA1). It then crosses the Owencurra River (FW1) which is bordered by two treelines (WL2), into an area of amenity grassland (GA2) before crossing an additional treeline (WL2) and entering back into the road (BL3). • The cable exits the road again at Gortacrue to facilitate crossing a gas line. The cable enters into a field of agricultural grassland (GA1) crossing a hedgerow twice before re-entering the road. • Four passing bays are required along this stretch. All are located within agricultural grassland bordered by hedgerows (WL1) and treelines (WL2).
DC03-DC04	• The cable route runs along the existing roadway (BL3) before entering into a tillage field (BC3). The route crosses a treeline (WL2) into a field of agricultural grassland (GA1). • The cable route then crosses two treelines (WL2), the Dungourney River (FW1), and scrub (WS1) before it enters into another field of agricultural grassland (GA1). • The cable route then exits back into the road (BL3) through a hedgerow (WL1).
DC04-DC05	• This stretch of the cable route is entirely within the existing roadway (BL3). • Four passing bays are required along this stretch of the road. These are all located within fields of agricultural grassland (GA1) bordered by hedgerows (WL1) and treelines (WL2). • A laydown area is required within an additional area of agricultural grassland (GA1). • One drainage ditch (FW4) requires crossing
DC05-DC06	• This stretch of the cable is entirely within the northern verge of the N25. • A laydown area is located within a tillage field (BC3). • Two drainage ditches require crossings, • The boundary of the Loughs Aderry and Ballybutler pNHA (000446) extends into the road
DC06-DC07	• The cable route crosses a treeline (WL2) into a tillage field (BC3). • It then crosses through two treelines which border a drainage ditch (FW2), into an agricultural field (GA1), and crosses a series of watercourses (Drainage ditches (FW4) and a river (FW2)_ and treelines (WL2) into agricultural grassland (GA1). • After crossing the Mogeely road (BL3) the route navigates a series of agricultural fields bordered by treelines (WL2) and hedgerows (WL1) before crossing back into the existing roadway (BL3).
DC07-DC08	• The cable route continues along the Killeagh road (BL3) either within the existing roadway or the verge. • The cable route exits the roadway, crossing a hedgerow (WL1) to cross the Moanlahan river (FW1) before re-entering the road. • One passing bay is required within a field of agricultural grassland. • The boundary of Clarashinka Pong pNHA extends into the road at this location.
DC08-DC09	• The cable route crosses a hedgerow into a field of agricultural grassland (GA1). The cable route then exits the field across a treeline (WL2) and road into a tillage field (BC3). • The cable route then crosses a series of treelines (WL2), hedgerows (WL1), the river Dissour (FW2) (two crossings) and fields of agricultural grassland (GA1) before re-entering the N25 roadway (BL3).
DC09-DC10	• The route continues within the existing road (BL3) entering occasionally into the verge.

Location	Habitats Within Footprint of the Proposed Development
	• At Ballyvergan west the cable route crosses hedgerow (WL1) and enters into agricultural grassland (GA1) to avoid a cattle underpass before re-entering the road. • A laydown area is required at Gortroe cross within a field of Agricultural Grassland (GA1) • One crossing of the river Dissour, two crossings of the womanagh river, and one crossing of the east Ballyvergan river are required.
DC11-DC12	• The route continues within the existing road before crossing into fields of wet grassland (GS4), Scrub (WS1) and reed swamp (FS1) associated with the Ballyvergan Marsh pNHA. • The cable re-enters the road (BL3) and until it reaches the landfall site.
Claycastle Landfall	• The landfall site is located within an area of fixed dune habitat (CD3) and the car park (BL3), before entering the foreshore.

2.2.2 Construction Phase Activities

Construction phase activities are outlined below:

2.2.2.1 Connection Point

The connection point is the point at which the Celtic Interconnector will connect to the HVAC national transmission grid enabling the transfer of electricity across the island of Ireland. The connection will be made by a single 400 kV HVAC cable underground circuit. The location for this connection point will be the existing 220 kV Knockraha substation in County Cork.

A connection to the 220 kV busbar will be required. This will be done by equipping an existing unused bay (bay F14) within the existing station. The bay will be equipped with new Air Insulated Switchgear (AIS) equipment, similar to other bays in the substation. This AIS equipment will consist of busbar disconnectors, circuit breakers, instrument transformers, transformer disconnectors, surge arresters, post insulators and tubular aluminium busbar. AIS is high voltage electrical equipment which uses the open air as its insulating medium. Live conductors are typically mounted outdoors on porcelain insulators on steel supports.

The single 400 kV cable circuit option will consist of three power cables (one cable per phase) and a single fibre optic link entering from the public road to the south into the ESB owned substation from which it will connect to the grid via the existing 220 kV busbar. One or more bunded transformers will be installed to ‘step down’ the voltage level of the 400 kV cable circuit to match the voltage level of the existing 220 kV busbar. The 400 kV bay, fitted out with 400 kV AIS equipment, will be installed within the existing footprint of the substation.

The proposed development at the connection point will be accommodated within the existing fence line of Knockraha substation.

2.2.2.2 Laying of Underground Cable

As detailed previously, the Celtic interconnector will connect to the Irish electricity transmission system at the connection point at Knockraha substation via a HVAC underground cable. AC is the technology utilised on the Irish electricity transmission network.

In contrast, electricity is best carried over long distances by means of HVDC technology. As such, a HVDC submarine cable will connect to a HVDC onshore underground cable at a TJB north of the car park at Claycastle Beach near Youghal in County Cork.

The majority of the HVAC and HVDC underground cables (UGCs) will be installed within the existing public road network. Off-road (cross-country) routes are proposed at particular locations to avoid constraints. These locations include:

- North of Claycastle Beach where, due to structural constraints associated with an existing narrow railway bridge, it is necessary to divert the UGC off road for approximately 241 metres in the area of, and under, the planned Midleton to Youghal Greenway (currently under construction). Approximately 65 metres of the 241 metres of land cable for this off-road section will be installed within Ballyvergan Marsh proposed Natural Heritage Area (pNHA (site code 000078).
- The villages of Killeagh and Castlemartyr will be avoided by means of cross-country routing; this will minimise disruption and nuisance for these villages, their residents and communities, and for traffic passing through the villages which are both located on the N25 Cork-Waterford-Wexford / Rosslare National route.

The HVAC and the HVDC UGCs will terminate at the converter station site compound described.

Laydown areas, where construction materials can be temporarily stored, and construction compounds, where welfare facilities can be provided, will also be required along the route.

Joint Bays

The cable will be delivered to site on drums. Joint bays will be required to be installed along the cable route to join consecutive lengths of cable and to facilitate cable pulling. These are underground chambers which are used as the location to pull the various lengths of UGC through pre-installed ducts, and to connect ("Joint") together those lengths of UGC into a single overall circuit. Typically, joint bay separation is between 500m and 850m, depending on the cable supplier, with all joint bays being located with the cable corridor. A 400kV joint bay is typically 6m x 3m.

Provision will also be made for the installation of (C2) communications chambers and link box chambers at various joint bay locations. The C2 chamber is used to join the fibre optic communications cable and the link box chambers are used to accommodate the link box, which earths the outer sheaths of the power cables.

The chambers are provided with removable lids and access to the chambers will be required on a permanent basis to facilitate maintenance. Typically, these chambers are located within the verge to minimise traffic disruption during routine maintenance.

Joint bays are not readily accessible during operation as there is no ongoing maintenance required; however, they need to be immediately accessible in the unlikely event of cable failure requiring cable replacement. The extent to which traffic management or other measures would be required in this situation will depend on the location of the joint bay within the roadway.

To facilitate traffic management at locations where joint bays are located within the carriageway, the use of temporary passing bays is proposed.

HVAC / HVDC Underground Cable

In general, and wherever possible, the UGC will be pulled into pre-installed ducts laid within a trench. The installation conditions of the cable, including depth, affect its performance.

The standard trench dimensions for a (400 kV) HVAC route is approximately 0.8m wide x 1.5m deep.

The standard trench dimensions for a HVDC route is approximately 0.8m wide x 1.3m deep.

These dimensions are based on a standard arrangement within the public roadway. In open land, for cross country routing, space is relatively unconstrained. Additional space may however

be required for route alignment to avoid underground objects such as tree roots or other unidentified obstructions that cannot be removed.

The final specific trench dimensions will be confirmed at detailed design stage.

A trench will be opened, the ducts installed in the correct arrangement and the trench will be backfilled with suitable back-fill material and marker boards for protection. Following duct installation, the road above the trench will be reinstated to match the environment in which it is installed to the standard required by the relevant authority at that location, in this case Cork County Council and / or TII.

Cable is manufactured and delivered to site on drums, in lengths of approximately 750 to 1000 metres, requiring the installation of joint bays to join consecutive lengths of cable together. Refer to Section 2.4.1 above for further detail on joint bays. A number of crossings of watercourses, drainage ditches, utilities, railway lines and the Midleton to Youghal Greenway will also be required along the cable route. These crossings will be facilitated by either open cut trenching or by use of Horizontal Directional Drilling (HDD) as and when appropriate.

2.2.2.3 Converter Station

Converter Station Building

Due to the ground conditions on the Ballyadam site, it is likely that rotary bored cast-in-place reinforced concrete piles socketed into rock will be adopted for all foundations on this site.

The converter station compound and ESB substation will measure approximately 3.6 hectares. The converter station compound will measure approximately 250m x 150m and will include three main buildings, up to 25m in height, outdoor equipment including 400 kV AIS equipment and four bunded transformers.

The key components of the proposed converter station and compound comprise:

- Main converter building;
- Control building;
- Storage buildings;
- Valve cooler area;
- Harmonic filter compound;
- Reactive compensation compound;
- Lightning protection poles;
- Lighting poles;
- Interface kiosk;
- Property fence / gates;
- Palisade fence / gates;
- Security lighting;
- Compound and control building for Transmission Asset Owner (TAO; i.e. ESB);
- Storm water drainage / Sustainable Urban Drainage System (SuDS) including below ground storage attenuation tanks;
- Landscaping and other associated finishing works; and
- Internal roads and access.

The main converter building will comprise a single storey structure divided into three halls; a reactor hall, a valve hall and a DC Hall.

The control room will house the auxiliary services equipment, such as control and telecoms equipment, low voltage switchgear, and emergency diesel generator, batteries and welfare facilities (i.e. toilets, messroom, etc.).

A below ground earth grid will be installed in a grid arrangement approximately 600mm below the finished surface. The earth grid will consist of a 95mm^2 bare stranded copper conductor. The purpose of the earth grid is to ensure personnel and public safety during electrical faults that may occur on the transmission grid.

Fencing around the entire converter station compound, with the exception of the site entrances gates, will comprise external 1.4m high post-and-rail property fencing and internal 2.6m high galvanised steel palisade fencing.

Water Supply

The proposed converter station will require a clean water supply for both fire-fighting and welfare purposes (i.e. hand-washing, toilet flushing etc.).

Due to the 'unmanned' nature of the proposed development, there will be no demand for water at the site during a typical week. Demand for water will arise however when personnel are present on site to carry out periodic inspections or maintenance work and the peak demand during this period has been estimated at 675 l/week based on the following assumptions:

- 4 No. person crew on-site for a total of 3 days;
- Per-capita demand of 45 litres per day and a peaking factor of 1.25 applied in line with Irish Water standards;
- No urinals or automatic flushing mechanisms in place; and,
- Taps incorporate automatic shut-off mechanisms.

Although records indicate that there are numerous water supply pipelines within the Ballyadam area, the IDA landholding, including the site of the proposed converter station, is not currently serviced. Permission will therefore be sought from Irish Water for a new connection to an existing 150mm watermain located in the local road which forms the western boundary of the overall IDA landholding.

Wastewater Drainage

The proposed converter station will require welfare facilities (toilets, wash-hand basins etc.) in a number of the buildings for use by staff when present on site.

As detailed above, the station will generally be 'unmanned, the peak loading during this period has therefore been estimated at 600 litres per week based on the following assumptions :

- 4 No. person crew on-site for a total of 3 days;
- Per-capita demand of 50 litres per day in line with Irish Water standards;
- No urinals or automatic flushing mechanisms in place; and
- Taps incorporate automatic shut-off mechanisms.

Records indicate that a 500mm diameter foul water drainage pipe has been laid in the south-west corner of the existing IDA site, presumably to facilitate connection to the public wastewater network by developers on the overall landholding. Due to the shallow depth of this pipe and the

significant distance (>700m) between it and the proposed convertor station compound, it is not possible to achieve a gravity connection to this pipeline.

Although a connection could be achieved by installing a package pumping station to lift flows to the discharge point, this option is undesirable from cost and reliability perspectives due to the very low and intermittent volumes of wastewater flow expected to be generated at the site. It is instead proposed that wastewater is collected in proprietary holding tanks which will be periodically emptied by a licensed waste disposal contractor to licenced facilities. Separate holding tanks will be provided for control buildings located in the converter station and for those located in the reactor compound to facilitate separate billing.

Storm Water Drainage

Development of the proposed converter station will require existing permeable ground to be replaced with impermeable surfaces (roads, roofs, etc.) and this will result in a corresponding increase in storm water runoff during rainfall events.

To comply with established best practice, a storm water drainage system incorporating SuDS features will be constructed to manage the quantity and quality of runoff during rainfall events. The system will operate by gravity and be sized to ensure that no internal property flooding occurs for the critical storm with a 1 in 100-year return period including a +20% allowance for climate change.

The proposed storm water drainage / SuDS system will incorporate the following key features:

- Traditional storm water collection and conveyance elements such as gutters, downpipes, gullies, channels and below ground pipework;
- Flow control devices (e.g. ‘hydrobrake’ or equivalent) to restrict the rate of discharge from the site to greenfield runoff rates;
- Below ground attenuation tanks to balance incoming flows and prevent flooding in the event of an extreme storm event;
- Silt traps and hydrocarbon interceptors to remove any pollutants which may have become entrained in the runoff; and,
- Shut-off valve chambers to prevent discharge from the drainage network in the event of an emergency.

All proposed surfaces and storm water drainage elements will be sealed to protect the soluble karst rock beneath the site.

Runoff is proposed to be discharged to an existing 600mm diameter storm water drainage pipe which has been laid in the south-west corner of the existing IDA site. This 600mm pipe is part of to the public storm water drainage system which serves the Carrigtwohill area and which discharges to ‘Slatty Water’ via Annagrove Stream.

Discharge from the converter station site and the associated access roads is proposed to be restricted to greenfield runoff rates in line with the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS Vol. 2 – New Development) which have generally been adopted by Local Authorities across the country.

Compensatory Storage

The existing lands within the footprint of the proposed convertor station include two large depressions which are understood to have been formed during undertaking of the previously

permitted site development works. The previously permitted development was subsequently abandoned but these excavations were never backfilled.

The depressions have a combined area of approximately 20,000m^2 and are between 2.5 and 3m in depth. They will need to be backfilled with suitable material in order to provide a stable foundation for the proposed convertor station compound.

This compensatory storage area will consist of a below ground and covered storage tank, which will be emptied at a controlled rate via a pumped connection to the storm water drainage system which will serve the proposed converter station access road. Discharge from the compensatory storage area will be restricted to greenfield runoff rates to ensure that there is no significant increase in flood risk elsewhere.

Flood water routing in the form of open channel drains and culverts will be installed around the perimeter of the proposed converter station to divert overland flow towards the dedicated compensatory storage area, rather than towards the location of the infilled depressions.

Site Access Roads

The proposed internal access road for the converter station site has been developed during detailed engagement with the IDA and its consultants to tie into the existing internal roads within the larger IDA landholding. This proposed internal access road has been developed independent of any potential future access routes to the Ballyadam site (including a potential N25 interchange to the south west). The design can however readily connect into such proposals in the future, in the context of the anticipated evolution of the overall IDA Ballyadam landholding as an industrial/employment node, without affecting the conclusions of this EIAR.

The internal access road is proposed to be a paved 8m wide two lane single carriageway with pathways each side. The road construction will consist of flexible pavement layers and relevant sub-base and capping layers.

The Irish landfall construction works will be progressed in two phases, to mitigate beach access restrictions and disturbance at the caravan park during the busy summer months. There are two options for landfall construction with varying levels of impact in terms of access restrictions and disturbance. Option 1 has the greater potential for impact and so is the basis for assessment in the onshore EIAR (Volume 3C2). Further detail is provided in Volume 3D.

Phase 1 will be conducted in the winter months (i.e. October to April inclusive) and will consist of the construction of the transition joint bay (TJB) and communication chambers, and the installation of the cable ducts within open cut trenches up the beach and into the beach car park. The areas will then be reinstated to their original condition prior to completion of this Phase. The estimated duration of the works is approximately ten weeks.

Phase 2 will be conducted in the summer months and will consist of the installation of the cables through the Phase 1 ducts. This will be achieved by pulling the cables from the cable lay vessel through the ducts by means of a cable winch located within the TJB chambers. The estimated duration of the works is approximately four weeks.

2.2.2.4 Landfall Construction

The cable ducts will be placed within excavated trenches up the beach from the sea to the TJB chambers. The excavation into the intertidal zone will require the temporary construction of a causeway, to form a stable platform from which excavators can work freely above the tidal zones. The platform and the trench excavation will be formed by a cofferdam (sheet piling) to mitigate against sea erosion during the winter months.

A portion of the trench route will pass below the carpark necessitating its temporary closure during phase 1 (winter months). These works can be conducted using conventional excavating machines and methods.

Phase One Installation

The first phase 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. A temporary sheet piled cofferdam will be required (for Option 1) to ensure trench stability and an adjacent temporary causeway will be required for access. The trench will be backfilled, and the site will be reinstated to its original condition following phase one installation (approximately 10 weeks).

Temporary sheet pilling (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 seawater and sediments. The steel sheet-piles will be installed using a pilling 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 a 5m spacing between centres, a 14m wide cofferdam is conservatively assumed to be sufficient. The cofferdam will be installed from a temporary causeway constructed adjacent to the cofferdam.

It is assumed that 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 8.0m wide causeway (est. 6000m3) is assumed to be sufficient. The temporary causeway will 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 would not require a causeway and the cofferdam would be much reduced in length, approximately 5m).

Following installation of the temporary cofferdam the trench will 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 3.11 provides a sketch of this phase of installation. Spoil material from the trench (est. 4000m^3) will 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 will be adequately covered to prevent exposure to the elements.

Following completion of the trench the conduits will 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) will be strung together by welding to form the conduit pipe string and transferred shoreward using lifting machinery.

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 will be required for phase two. The temporary winch platform will be established on the shore side of the TJB in order to pull the cables through the conduits and into the TJB. It is proposed to construct this platform during phase one to minimise disruption to third parties in phase two.

It is assumed that a 20m x 20m winch platform will be sufficient for this operation. The platform will be of hard standing, typically compacted aggregate. The platform will be level; however, a slight sloping angle may be advantageous for cable vertical alignment during the pull operations and to manage surface water drainage.

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 would require 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 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.

A cable winch will be installed on the temporary plinth located behind the TJB. The onshore end of the messenger wire shall be retrieved from the TJB and connected to the cable winch wire.

The submarine cables will arrive on site aboard a cable lay vessel. The messenger wire will be transferred to the cable lay vessel for connection to the end of the submarine cable.

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. 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 will commence. For this, a plough / jetter will 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.

Landfall Transition Joint Bay Chambers

The submarine cables will be jointed with the land cable within underground TJB chambers. The chambers will have approximate plan dimensions of 15m x 4m x 3m deep and will be installed behind the landfall area at Claycastle Beach. Such chambers generally consist of reinforced concrete base slab and walls. The chamber is then typically backfilled with a suitable material (such as cement bound sand) following installation of the cable joints. The top layer can then be backfilled. It is estimated that construction of the transition joint bay chambers will take

approximately 18 weeks and will commence at the beginning of Phase 1 activities, as appropriate, having regard to any seasonal constraints that may apply.

The extent of the area required for the joint bay chamber construction works will be minimised as much as possible to limit potential access restrictions for the public to the carpark.

Temporary Laydown Areas

All temporary laydown areas will be secured with hoarding / fencing around their perimeter as appropriate.

Where an access road is required, engineering stone fill will be laid and compacted and maintained as required for the duration of the works.

Temporary Construction Compounds

Temporary construction compounds will be required at the connection point (Knockraha substation), the converter station (Ballyadam) and the landfall (Claycastle). Final agreement of specific locations of these compounds will be a matter for the appointed contractor with the planning authority.

All temporary construction compounds will be secured with hoarding / fencing around the compound perimeters as appropriate. Where temporary construction areas are required and existing hardstanding is not available, engineering stone fill will be laid and compacted and maintained as required for the duration of the works. Once the works are completed, the engineered stone fill will be removed and the land will be reinstated to its original condition.

All construction workers will be directed to use the designated access / egress routes only.

Temporary facilities will be provided which will include construction phase car parking and welfare facilities and temporary material storage areas as necessary. Any discharges from temporary welfare facilities will be connected to a sealed holding tank to be emptied and disposed of off-site by a licenced contractor to an approved licenced facility.

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

All temporary security lighting will be directional and cowled, away from vegetated areas and wetlands.

2.2.3 Operational Phase Activities

Converter Station

The converter station does not require any full-time personnel for operation. Two types of maintenance regimes will be required on an annual basis for the converter station, namely scheduled and unscheduled maintenance.

Scheduled maintenance of the converter station will occur once a year and take approximately three days for a crew of four personnel. The HVDC link will need to be taken offline for essential maintenance during this time. This maintenance will involve replacement of faulted power electronic equipment, replacement of faulted fibre optic links, general cleaning of HV areas and visual inspection of HV plant.

Typically, every five years, during this scheduled maintenance, more invasive maintenance works will be required for works such as transformer taps cleaning and switchgear cleaning.

Unscheduled maintenance of the converter station will typically occur at unknown times throughout the year and, it is assumed for the purpose of this EIAR, will lead to loss of operation for approximately 3 days per annum to repair and / or replace faulted equipment. Unscheduled maintenance occurs due to unforeseen trips and emergency outages, but these will be infrequent.

2.2.4 Decommissioning Phase Activities

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, it is assumed that the equipment will be decommissioned and replaced with new equipment.

The HVAC and HVDC 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. All equipment for the converter station will be removed for recycling or disposal as required by the regulations are the time.

2.2.5 Summary of potential for impacts.

In the absence of mitigation measures, there is the potential for the following impacts.

Construction Phase:

- Potential for direct impact to habitats and species within the footprint of the Proposed Development.
- Potential for indirect impact to habitats and species within the vicinity / downstream of the proposed of the Proposed Development.
- Potential for generation of dust
- Potential for generation of surface-water pollution/sedimentation.
- Potential for noise and vibration effects.

Operational Phase:

- Given the nature of the works required at the operational phase, none anticipated.

Decommissioning phase:

- As per construction phase.

2.3 European Sites in the Zone of Influence

2.3.1 Zone of Influence

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.

The ZoI identified for various ecological receptors, having regard to the potential for impact as outlined previously are as outlined below:

- 100m either side of the cable route midline for breeding passerines (Whitfield *et al.* 2008)
- 200m either side of the cable route midline for terrestrial habitats as this is the likely zone for physical and dust effects associated with the works (NRA 2011).
- 380m for disturbance effects to wetland bird species (based on noise levels at Claycastle taken as the worst-case scenario for construction phase for the development as outlined in the EIAR)
- 150m for terrestrial mammals (NRA 2006)
- 1km for physical disturbance for certain breeding birds of prey
- Catchment wide ZoI for surface waterbodies
- 500m for drilling activities[3], 1km for piling activities for noise impacts to Marine Mammals (NRA 2014)

2.3.2 Source-Pathway-Receptor and Impact Assessment

Projects have the potential to impact on European sites beyond the footprint of the project itself. National Guidance[4] states that screening for AA should be carried out for any European Site within the likely 'Zone of Influence' of a plan or project. For projects, the guidance recommends that the Zone of Influence (ZoI) must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects.

In order to establish the ZoI of the Proposed Development, desktop and field survey data on protected habitats and species was mapped using a Geographic Information System (GIS). This data was interrogated for source-pathway-receptor connectivity.

The source (potential impacts from the Proposed Development), pathways (hydrological, physical or ecological connectivity) and receptors (QIs and SCIs of the European sites) were identified through a combination of bespoke field survey, and desktop survey including use of GIS software. and through examination of aerial photography. Any European sites identified to

[3] It is noted that the drilling activities as referenced in the NPWS guidance pertain to offshore activities. However, in the absence of ZoI information pertaining to coastal drilling, and having regard to the precautionary principal, the ZoI is taken to include drilling works associated with the HDD section of the offshore elements.

[4] Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government, 2009

have a viable source-pathway-receptor link to the Proposed Development were then examined further to determine the potential for significant effects.

The potential environmental effects of the Proposed Development can be summarised as:

- Dust deposition;
- Noise and vibration;
- Lighting (temporary and permanent);
- Accidental release of pollutants into surface waters, and underground conduits;
- Introduction, dispersal or spread of invasive species; and,
- Sedimentation of surface waters from site runoff and dewatering of excavations.

All works associated with the onshore elements of the Project are located wholly outside of the boundaries of any European sites. The location of the red line boundary for the Proposed Development in relation to European sites is provided in Appendix C

Table 2.3 includes the source-pathway-receptor assessment for the Proposed Development.

Table 2.3: Source-Pathway-receptor Assessment and Assessment of Potential for Significant Effects

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Special Area of Conservation (SAC)				
Great Island Channel SAC (001058) (NPWS 2014)	1.7km	Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	Downstream hydrological connectivity has been identified via the following watercourses: • Tibbotstown_010 • Owennacurra_030 • Owennacurra_040 • Dungourney_020 The potential for ground water connectivity via underground karst systems within the Converter station site has been identified. Given the proximity of the converter station site to the SAC, these underground systems have the potential to act as conduits for surface water and ground water pollutants. On this basis, a viable source pathway receptor link is identified in terms of surface water pollution.	Given the multiple hydrological routes identified with connectivity to Great Island SAC, a pathway for surface water pollutants to enter into the European Site has been identified. Surface water pollutants have the potential to result in degradation of habitats associated with Great Island SAC. On this basis, the potential for significant effects to Great Island Channel SAC is identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Ballymacoda (Clonpriest and Pillmore) SAC (000077) (NPWS 2015)	2.8km	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	Downstream hydrological connectivity has been identified via the following watercourses: • Womanagh_010" • Womanagh_020 • Moanlahan_010 • Dissour_020 • Womanagh_030 • East Ballyvergan_010 On this basis, a viable source pathway receptor link is identified in terms of surface water pollution.	Given the multiple hydrological routes identified with connectivity to Ballymacoda (Clonpriest and Pillmore) SAC a pathway for surface water pollutants to enter into the European Site has been identified. Surface water pollutants have the potential to result in degradation of habitats associated with the SAC. On this basis, the potential for significant effects to Ballymacoda (Clonpriest and Pillmore) SAC is identified.
Blackwater River (Cork/Waterford) SAC (002170) (NPWS 2016)	1.4km	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	Hydrological connectivity is present through the coastal waters of Youghal Bay, and the Lower Blackwater Estuary. Given that any pollutants associated with the Project would likely be dissipated significantly prior to entering into the European site boundary due to the pathway via freshwater, coastal water and transitional water.	Given the nature of the QIs associated with the Blackwater River SAC the potential for effects to Blackwater River (Cork/Waterford) SAC has been identified through degradation of coastal water quality, and disturbance effects through noise and vibration. On this basis, the potential for significant effects to Blackwater River (Cork/Waterford) SAC is identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]* *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Austropotamobius pallipes* (White-clawed Crayfish) [1092] *Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra planeri (*Brook Lamprey) [1096] *Lampetra fluviatilis* (River Lamprey) [1099] *Alosa fallax* (Twaite Shad) [1103] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	A number of Qualifying Interests species associated with the European Site may also occur outside of the European Site boundary in proximity to the works areas. On this basis a viable source-pathway-receptor link is identified in terms of both surface water pollution, and noise and vibration effects.	

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Trichomanes speciosum (Killarney Fern) [1421]		
Lower River Shannon SAC (002165) (NPWS 2012)	78km	Sandbanks which are slightly covered by sea water all the time [1110] Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	The Lower River Shannon SAC is located a significant distance from the works. Based on the distance, with the exception of bottlenose dolphin, none of the QIs associated with this site have potential to occur within the ZoI for the works. The ZoI, as identified by NPWS (2014) for drilling works is 500m. The nearest extent of drilling required for the offshore development is located within Ballyvergan Marsh. The southernmost receptor pit is located such that the zone of impact only extends approximately 200m below the High-Water Mark (HWM). Given that these are shallow coastal waters, predominantly containing beach habitats the	Given that no viable source pathway receptor link has been identified to the SAC, no potential for likely significant effects has been identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Alluvial forests with *Alnus glutinosa and Fraxinus* excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra planeri* (Brook Lamprey) [1096] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Lutra lutra* (Otter) [1355]	source pathway receptor link is not deemed to be viable.	

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Saltee Islands SAC (000707) (NPWS 2011)	81km	Mudflats and sandflats not covered by seawater at low tide [1140] Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Submerged or partially submerged sea caves [8330] *Halichoerus grypus* (Grey Seal) [1364]	The Saltee Islands SAC is located a significant distance from the works. Based on the distance, with the exception of grey seals, none of the QIs associated with this site have potential to occur in proximity to the ZoI for the works. The ZoI, as identified by NPWS (2014) for drilling works is 500m. The nearest extent of drilling required for the offshore development is located within Ballyvergan Marsh. The southernmost receptor pit is located such that the zone of impact only extends approximately 200m below the High-Water Mark (HWM). Given that this area has not been identified as a regular haul out location for seals, the source pathway receptor link is not deemed to be viable.	Given that no viable source pathway receptor link has been identified to the SAC, no potential for likely significant effects has been identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Roaring water Bay and Islands SAC (000101) (NPWS 2011)	86km	Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330] *Phocoena phocoena* (Harbour Porpoise) [1351] *Lutra lutra* (Otter) [1355] *Halichoerus grypus* (Grey Seal) [1364]	The Roaring water Bay and Islands SAC is located a significant distance from the works. Based on the distance, with the exception of grey seals, and harbour porpoise, none of the QIs associated with this site have potential to occur in proximity to the ZoI for the works. The ZoI, as identified by NPWS (2014) for drilling works is 500m. The nearest extent of drilling required for the offshore development is located within Ballyvergan Marsh. The southernmost receptor pit is located such that the zone of impact only extends approximately 200m below the High-Water Mark (HWM). Given that this area has not been identified as a regular haul out location for seals, and that records for harbour porpoise in the area are related to strandings, the source pathway receptor link is not deemed to be viable.	Given that no viable source pathway receptor link has been identified to the SAC, no potential for likely significant effects has been identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Slaney River Valley SAC (000781) (NPWS 2011)	101km	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra planeri* (Brook Lamprey) [1096] *Lampetra fluviatilis* (River Lamprey) [1099]	The Slaney River Valley SAC is located a significant distance from the works. Based on the distance, with the exception of harbour seals, none of the QIs associated with this site have potential to occur in proximity to the ZoI for the works. The ZoI, as identified by NPWS (2014) for drilling works is 500m. The nearest extent of drilling required for the offshore development is located within Ballyvergan Marsh. The southernmost receptor pit is located such that the zone of impact only extends approximately 200m below the High-Water Mark (HWM). Given that this area has not been identified as a regular haul out location for seals, the source pathway receptor link is not deemed to be viable.	Given that no viable source pathway receptor link has been identified to the SAC, no potential for likely significant effects has been identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Alosa fallax fallax (Twaite Shad) [1103] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Phoca vitulina* (Harbour Seal) [1365]		
Blasket Islands SAC (002172) (NPWS 2014)	147km	Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330] *Phocoena phocoena* (Harbour Porpoise) [1351] *Halichoerus grypus* (Grey Seal) [1364]	The Blasket Islands SAC is located a significant distance from the works. Based on the distance, with the exception of harbour seals, none of the QIs associated with this site have potential to occur in proximity to the ZoI for the works. The ZoI, as identified by NPWS (2014) for drilling works is 500m. The nearest extent of drilling required for the offshore development is located within Ballyvergan Marsh. The southernmost receptor pit is located such that the zone of impact only extends approximately 200m below the High-Water Mark (HWM). Given that this area has not been identified as a regular haul out location for seals, and that records for harbour	Given that no viable source pathway receptor link has been identified to the SAC, no potential for likely significant effects has been identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
			porpoise in the area are related to stranding, the source pathway receptor link is not deemed to be viable.	
West Connacht Coast SAC (002998) (NPWS 2015)	212km	Tursiops truncatus (*Common Bottlenose Dolphin*) [1349]	The Blasket Islands SAC is located a significant distance from the works. Based on the distance, with the exception of harbour seals, none of the QIs associated with this site have potential to occur in proximity to the ZoI for the works. The ZoI, as identified by NPWS (2014) for drilling works is 500m. The nearest extent of drilling required for the offshore development is located within Ballyvergan Marsh. The southernmost receptor pit is located such that the zone of impact only extends approximately 200m below the High-Water Mark (HWM). Given that these are shallow coastal waters, predominantly containing beach habitats, and history records relate to	Given that no viable source pathway receptor link has been identified to the SAC, no potential for likely significant effects has been identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
			strandings, the source pathway receptor link is not deemed to be viable.	
Special Protection Area (SPA)				
Cork Harbour SPA (004030) (NPWS 2014)	1.9km	<u>Non-breeding: populations:</u> Little Grebe (*Tachybaptus ruficollis*) [A004] Great Crested Grebe (*Podiceps cristatus*) [A005] Cormorant (*Phalacrocorax carbo*) [A017] Grey Heron (*Ardea cinerea*) [A028] Shelduck (*Tadorna tadorna*) [A048] Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Pintail (*Anas acuta*) [A054] Shoveler (*Anas clypeata*) [A056] Red-breasted Merganser (*Mergus serrator*) [A069]	Downstream hydrological connectivity to Cork Harbour SPA has been identified via the following watercourses: • Tibbotstown_010 • Owennacurra_030 • Owennacurra_040 • Dungourney_020 The potential for underground karst systems within the Converter station site has been identified. These underground systems have the potential to act as conduits for surface water pollutants. On this basis, a viable source pathway receptor link is identified in terms of surface water pollution.	Given the multiple hydrological routes identified with connectivity to Cork Harbour SPA a pathway for surface water pollutants to enter into the European Site has been identified. This has potential to result in a degradation of supporting habitat for the SCIs associated with the SPA. There is potential for temporary disturbance/ displacement effects due to noise and vibration associated with the works. On this basis, the potential for significant effects to Cork Harbour SPA is identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Oystercatcher (*Haematopus ostralegus*) [A130] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Greenshank (*Tringa nebularia*) [A164] Common Gull (*Larus canus*) [A182] Lesser Black-backed Gull (*Larus fuscus*) [A183] <u>Breeding Populations</u> *Podiceps cristatus*) [A005]	There is potential for SCIs associated with the SPA to occur outside of the site boundaries and in proximity to the works areas. As such, a second viable source-pathway-receptor link is identified.	

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Common Tern (*Sterna hirundo*) [A193] – <u>Other</u>: Wetland and Waterbirds [A999]		
Ballymacoda Bay SPA (004023) (NPWS 2015)	1.4km	<u>All non-breeding populations:</u> Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Ringed Plover (*Charadrius hiaticula*) [A137] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142] Sanderling (*Calidris alba*) [A144] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162]	Downstream hydrological connectivity has been identified via the following watercourses: • Womanagh_010" • Womanagh_020 • Moanlahan_010 • Dissour_020 • Womanagh_030 • East Ballyvergan_010 On this basis, a viable source pathway receptor link is identified in terms of surface water pollution. There is potential for SCIs associated with the SPA to occur outside of the site boundary and in proximity to the works area. As such, a viable source-pathway-receptor link is identified in terms of direct impact and noise and vibration effects.	Given the multiple hydrological routes identified with connectivity to Ballymacoda Bay SPA a pathway for surface water pollutants to enter into the European Site has been identified. This has potential to result in a degradation of supporting habitat for the SCIs associated with the SPA. Further, where QIs may occur outside of the site boundaries, there is potential for temporary disturbance/ displacement effects due to noise and vibration associated with the works. On this basis, the potential for significant effects to Ballymacoda Bay SPA is identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Turnstone (*Arenaria interpres*) [A169] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Common Gull (*Larus canus*) [A182] Lesser Black-backed Gull (*Larus fuscus*) [A183] <u>Other</u> Wetland and Waterbirds [A999]		
Blackwater Estuary SPA (004028) (2012)	2.4km	<u>All Non-breeding populations</u> Wigeon (*Anas penelope*) [A050] Golden Plover (*Pluvialis apricaria*) [A140] Lapwing (*Vanellus vanellus*) [A142] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] <u>Other</u>	Hydrological connectivity is present through the coastal waters of Youghal Bay, and the Lower Blackwater Estuary. Given that any surface water run-off associated with the Project would likely be dissipated significantly prior to entering into the European site boundary due to the pathway via freshwater, coastal water and transitional water. Despite this, there is potential for SCIs to occur outside of the European Site boundary. As such, a viable source pathway receptor link has been identified in terms of direct	Given the multiple hydrological routes identified with connectivity to Ballymacoda Bay SPA a pathway for surface water pollutants to enter into the European Site has been identified. This has potential to result in a degradation of supporting habitat for the SCIs associated with the SPA. Further, where SCIs may occur outside of the site boundaries, there is potential for temporary disturbance/ displacement effects due to noise and vibration associated with the works.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
		Wetland and Waterbirds [A999]	impact to species, and noise and vibration effects.	On this basis, the potential for significant effects to Cork Harbour SPA is identified.
Mullaghanish to Musheramore Mountains SPA (004162) (2020)	45km	Hen Harrier (*Circus cyaneus*) [A082] - Breeding	It is noted that there is a considerable distance between Mullaghanish to Musheramore Mountains SPA and the works areas. However, it has been established that hen harrier migrate outside of breeding grounds to lowland winter roosting areas between October and March (Watson 1977, Clarke & Watson 1990, O'Donoghue 2019, O'Donoghue 2021). Wintering hen harrier roosts are well known to occur in the Ballyvergan Marsh area. As such, there is potential for	Viable source-pathway-receptor links have been identified for direct impact, and noise and vibration effects to wintering hen harrier in the vicinity of the works. On this basis the potential for significant effects to Mullaghanish to Musheramore Mountains SPA has been identified.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European Site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
			wintering hen harrier to roost in proximity to works areas. As such, a viable source pathway receptor link has been identified in terms of direct impact to supporting habitat, and through disturbance caused by noise and vibration.	

2.4 Plans and Projects Which Might Act in Combination

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

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.

It is therefore required that the potential impacts of the Proposed Development are considered in combination with any other relevant plans or projects. A search of planning applications[5] in the vicinity of the works was undertaken in December 2020 to examine projects with potential for in combination effects. Applications which were made typically consisted of extensions, demolitions and renovations to existing houses and agricultural buildings, and retention of existing developments.

Given the location of these works in relation to the European sites, and the Project there is no potential for in-combination effects.

Other, larger scale, projects which were identified are outlined hereunder:

Celtic Interconnector Project below High Water Mark

As previously noted, this AA Screening assesses the effects on European sites of the Irish land-based elements of the Project (down to, and including the High Water Mark), in combination with other plans or projects, including Irish Project elements below the High Water Mark, Irish elements offshore, elements in the UK Exclusive Economic Zone, and French elements of the Project.

A separate AA Screening and NIS has been drafted for the (Irish) Offshore elements of the works ('the Irish offshore NIS'). The AA Screening for the Irish offshore NIS could not exclude the potential for likely significant effects on the Ballymacoda Bay SPA and the Blackwater Estuary SPA. However, the Irish offshore NIS' concluded there would be no adverse effects on the integrity of any European sites, either alone or in combination with other plans or projects.

Should works associated with the cable route up to the high water mark take place concurrently to the works at the landfall location, there is potential for an in-combination effect on the Ballymacoda Bay SPA and the Blackwater Estuary SPA resulting in increased noise emissions.

A Habitats Regulations Assessment (HRA) Screening assessment was produced for the UK (offshore) elements of the Project. This concluded that the potential for significant effects on the conservation objectives on European sites designated by the UK could be excluded for the Celtic Interconnector Project alone and in-combination with other plans and projects.

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 project alone, and in combination with other plans or projects.

Refer to Volume 6C for the Overarching project-wide NIS, which summarizes the conclusions of Article 6(3) reports across jurisdictions and concludes on the project-wide impacts to European sites.

[5] Planning Websites: Cork County Council, Waterford County Council and An Bord Pleanala.

Midleton to Youghal Greenway

The project comprises a Greenway route which runs from the north-eastern corner of Midleton to the old railway station at Youghal in east Cork. As part of the application an Appropriate Assessment Screening report was prepared.

The AA screening report for the greenway concludes that:

"*Appropriate Assessment, based on the best available scientific information, demonstrates that construction and operation of the proposed Greenway between Midleton and Youghal, Co. Cork, poses no risk of likely significant effects on Natura 2000 sites (e.g. Great Island Channels SAC, Cork Harbour SPA, Ballymacoda (Clonpriest and Pillmore) SAC or Ballymacoda Bay SPA)*." This conclusion demonstrates there will be no adverse effects on the integrity of any European sites.

Construction works for the greenway are currently progressing and will be completed in advance of the construction phase of the Project. No potential for disturbance to wintering birds was identified in the AA screening for the greenway, as no supporting habitat was identified within or along the scheme.

There is potential for surface water run-off associated with the Midleton to Youghal greenway works. However, the timing of the works is such that the greenway will be constructed prior to the commencement of the construction phase of this Proposed Development. No potential for likely significant in-combination effects has been identified.

Midleton Carrigtohill WWTP upgrades

Irish Water have identified plans to upgrade the capacity of the sewage treatment system in the greater Midleton area. Site Investigation (SI) works are required to inform the design of the treatment plant. These SI works are anticipated to commence in Q1 2021. As such they will be taking place prior to works for Celtic Interconnector. The SI works are of short duration, and small scale in nature. Further the SI works do not overlap with the boundaries of any European sites. Irish Water has published an AA Screening Determination (Irish Water, 2021), concluding that likely significant effects from the SI works on European sites can be excluded on the basis of objective evidence. As such No potential for likely significant in-combination effects has been identified.

Following the design of the proposed upgrades, the project for the upgrades of the Midleton and Carrigtohill WWTP will be subject themselves to the provisions of Article 6(3), i.e. requiring screening for Appropriate Assessment as a minimum, and AA, if necessary.

Urban Expansion Project

The urban expansion of the area to the northwest of the converter station site is planned to facilitate housing development. As well as residential development, the proposals will include cycling/pedestrian facilities, a new school campus and road upgrades.

Following the design of the proposed expansion project, the expansion project will be subject themselves to the provisions of Article 6(3), i.e. requiring screening for Appropriate Assessment as a minimum, and AA, if necessary. .

Cork County Development Plan

The proposed Development is located within the Cork County administrative area. The document includes objectives and policies which are associated within the protection of the natural environment. These are informed in part by an Appropriate Assessment which was undertaken to ensure that any likely effects of the plans' policies were considered in order to avoid any such adverse impacts.

The Natura Impact Report outlines European Sites which were subject to review, screening conclusions and key planning requirements to protect/restore site integrity. A summary of this assessment are provided in table Table 3.16 in relation to European Sites identified as within the ZoI for the Proposed Development.

Table 2.4: County Development Plan Screening Conclusions

European Site Name	CDP Screening Conclusion	Planning Requirements Identified in the CDP to Protect/Restore Site Integrity
Great Island Channel SAC	Potential for impacts identified relating to Port activities, designation of Strategic Employment Centres, Core Strategy, upgrading of roads infrastructure within and around the Harbour, allocation of increased population around Harbour, policies relating to tourism and recreation.	• Maintain/restore a high standard of water quality in discharging rivers and transitional coastal zones within Cork Harbour; • Prevent direct loss of estuarine habitats within the SAC; • Prevent drainage of wetland habitats; • Protect estuarine habitats from risk of toxic contamination arising from industrial and port related activities common in the harbour area.
Ballymacoda (Clonpriest and Pillmore) SAC	Not identified as having potential to be impacted by the CDP. The site was screened out at the draft development plan stage	• Maintain or restore a high standard of water quality in discharging rivers and transitional coastal zones in bay area • Prevent direct loss of estuarine habitats within the SAC • Prevent drainage of wetland habitats • Prevent contamination or deterioration of estuarine habitats
Blackwater River (Cork/Waterford) SAC	Potential for significant impacts to arise relating in particular to Core Strategy, Wind Energy Strategy, and provision of roads infrastructure.	• Restore a high standard of water of water quality in surface waters in SAC; • Maintain open channels to allow the free passage of fish in freshwater habitats; • Maintain stable hydrological regime in surface waters in SAC; • Prevent direct loss of freshwater habitats within SAC; • Prevent drainage of wetland habitats; • Prevent contamination or other deterioration of freshwater habitats in SAC; • Prevent disturbance to otter and otter habitat.
Cork Harbour SPA	Potential for impacts Identified relating to Port activities, designation of Strategic Employment Centres, Core Strategy, upgrading of roads infrastructure within and around the Harbour, allocation of increased population around Harbour, policies relating to tourism and recreation.	• Prevent disturbance to wintering birds; • Maintain/restore a high standard of water quality in discharging rivers and transitional coastal zones in bay area; • Prevent direct loss of estuarine habitats within the SAC; • Prevent drainage of wetland habitats; • Prevent contamination or deterioration of estuarine habitats.
Ballymacoda Bay SPA	Not identified as having potential to be impacted by the CDP.	
Blackwater Estuary SPA	Potential impacts identified relating to inadequate treatment of wastewater and tourism policies.	

European Site Name	CDP Screening Conclusion	Planning Requirements Identified in the CDP to Protect/Restore Site Integrity
Mullaghanish to Musheramore Mountains SPA	No potential impacts specified but amendments recommended to draft plan re wind energy policy and provision of wastewater infrastructure	• Prevent disturbance to breeding birds; • Protect feeding and breeding habitat of hen harrier

Adherence to the Council's policies and objectives will ensure that all plans and projects proposed within the county are subjected to the tests of Appropriate Assessment. This will assess the potential for likely significant effects to European Sites, and where deemed necessary, the potential for an adverse effect on European Site integrity, either alone or in combination with other plans and projects.

2.5 Summary of Potential Significant Effects

Potential for likely significant effects from the Proposed Development on European sites have been identified. The potential for likely significant effects has been identified to the following European sites, in combination with other plans and projects:

- Great Island Channel SAC
- Ballymacoda (Clonpriest and Pillmore) SAC
- Blackwater River (Cork/Waterford) SAC
- Cork Harbour SPA
- Ballymacoda Bay SPA
- Blackwater Estuary SPA
- Mullaghanish to Musheramore Mountains SPA

2.6 Screening Outcome

The current assessment investigates the potential for the Proposed Development to have Likely Significant Effects on European sites within the Natura 2000 network, in combination with other plans or projects.

This AA Screening report concludes that likely significant effects on European sites cannot be excluded on the basis of objective evidence, from the project alone, and in combination with other plans or projects. A screening matrix of the Proposed Development is provided hereunder in Table 2.5.

Table 2.5: Screening Matrix of the Proposed Development

Screening Matrix	
Brief description of the project or plan	The Celtic Interconnector is a proposed electrical link which will enable the movement of electricity between Ireland and France. The Celtic Interconnector will use High Voltage Direct Current (HVDC) technology for the subsea transfer of electricity. The main elements of the Celtic Interconnector are presented below and illustrated overleaf: A submarine circuit, approximately 500km in length placed on or beneath the seabed between France and Ireland. A landfall point where the submarine circuit comes onshore. A HVDC land circuit between the landfall and a converter station. As this will be HVDC, it is proposed to use an underground cable for this element. A converter station, to convert the electricity from HVDC to High Voltage Alternating Current (HVAC), which is used on the transmission grid.

	A HVAC land circuit between the converter station and the connection point to the grid. This circuit can be underground connection point to an existing substation on the transmission grid.
European Sites Identified at Potential Risk from Likely Significant Effects	• Great Island Channel SAC • Ballymacoda (Clonpriest and Pillmore) SAC • Blackwater River (Cork/Waterford) SAC • Cork Harbour SPA • Ballymacoda Bay SPA • Blackwater Estuary SPA • Mullaghanish to Musheramore Mountains SPA
Assessment Criteria	
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European site.	• The Proposed Development will require clearance and excavation of lands to accommodate the works from the landfall point and transition bays, along the cable route, at the converter station site and at the connection point. There is potential for an associated increase in soil erosion, dust and runoff from site. • The works will require the use of concrete and other potentially toxic materials which have potential to be released into underground conduits and surfacewater. Concrete for example can be particularly harmful in aquatic environments where it can cause sudden change in pH, increase turbidity as well as smother substrates / flora/ fauna. • The construction works will require use of heavy machinery which will cause an increase in noise and potentially vibration levels in the locality. • Crossing of watercourses may be achieved by Horizontal Directional Drilling. This method of construction uses bentonite which can cause environmental damage if it escapes from the bore.
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site by virtue of: Size and scale; Land-take; Distance from the Natura 2000 site or key interests of the site; Resource requirements (water abstraction etc); Emissions (disposal to land, water or air); Excavation requirements; Transportation requirements; Duration of construction, operation, decommissioning Other.	The Proposed development will be wholly outside of any European sites and will not require any land-take within the site boundaries. The works will be approximately 1.5km from nearest the European sites (Blackwater River (Cork/Waterford) SAC and Ballymacoda BAY SPA) at its closest point Potential impacts of the Proposed Development are as follows: • There is potential for degradation in water quality of the following watercourses which have hydrological connectivity to European sites (listed above) downstream. – Womanagh_010" – Butlerstown_030 – Dissour_020 – Dungourney_020 – East Ballyvergan_010 – Moanlahan_010 – Owennacurra_030 – Owennacurra_040 – Tibbotstown_010 – Womanagh_020 – Womanagh_030 There is potential for an associated degradation to habitats within European Site boundaries caused by this. This may be exacerbated through in-combination effects associated with the Youghal to Midleton Greenaway. • The potential for pollutants to enter into underground karst systems associated with converter station site is uncertain, but cannot be ruled out at this stage. • There is potential for the spread of invasive species caused by the works

	• There is potential for temporary (construction phase) noise and visual disturbance to wintering birds at Lough Aderry pNHA and Ballybutler pNHA, Ballyvergan Marsh and Claycastle Beach. Bird species SCI bird species associated with SPA's in the region.
Describe any likely changes to the site arising as a result of: Reduction in habitat area; Disturbance to key species; Habitat or species fragmentation; Reduction in species density; Changes in key indicators of conservation value (water quality etc.); Climate change.	• A degradation in water quality could potentially reduce the carrying capacity of supporting habitat for QIs/SCIs of the European sites. • Noise and vibration associated with the works has the potential to result in disturbance leading to fragmentation and /or displacement to *ex situ* QIs/SCIs • The spread of invasive species has the potential to out-compete plant species which support the QIs/SCIs for European sites.
Describe any likely impacts on the Natura 2000 site as a whole in terms of: Interference with the key relationships that define the structure of the site; Interference with key relationships that define the function of the site.	• Effects that have been identified associated with the woks have the potential to result in a degradation of habitats within European sites, and a degradation/loss of supporting habitat associated with *ex-situ* Qualifying Features of European sites.
Provide indicators of significance as a result of the identification of effects set out above in terms of: Loss; Fragmentation; Disruption; Disturbance; Change to key elements of the site.	Indicators of significance are: • Direct loss or fragmentation of significant supporting habitat • Reduction in protected and supporting habitat quality or area as may be caused by a change in water quality • Disturbance of ex situ QIs/SCIs away from supporting habitat A reduction in population density of QIs/SCIs as may be caused by disturbance from key supporting habitat
Describe from the above those elements of the project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	Disturbance effects and surface water degradation caused by emissions have the potential to result in likely significant effects to European sites.

3 Natura Impact Statement

This Natura Impact Statement (NIS) has been produced in support of the Appropriate Assessment of the Proposed Development to be undertaken by the competent authority. The NIS considers in greater detail the elements of the Proposed Development with potential for likely significant effects and further examines the Proposed Development will adversely affect the integrity of European sites with respect to each site's conservation objectives. Mitigation measures are identified to avoid adverse effects on the integrity of European sites.

3.1 Summary of Screening Outcome

The findings of the Screening for Appropriate Assessment report determined that the Proposed Development has the potential to result in likely significant effects on the QIs/SCIs of the following European sites:

- Great Island Channel SAC;
- Ballymacoda (Clonpriest and Pillmore) SAC;
- Blackwater River (Cork/Waterford) SAC;
- Cork Harbour SPA;
- Ballymacoda Bay SPA;
- Blackwater Estuary SPA; and,
- Mullaghanish to Musheramore Mountains SPA.

3.1.1 Construction Phase Activities

Construction phase activities are outlined below:

3.1.1.1 Connection Point

The connection point is the point at which the Celtic Interconnector will connect to the HVAC national transmission grid enabling the transfer of electricity across the island of Ireland. The connection will be made by a single 400 kV HVAC cable underground circuit. The location for this connection point will be the existing 220 kV Knockraha substation in County Cork.

A connection to the 220 kV busbar will be required. This will be done by equipping an existing unused bay (bay F14) within the existing station. The bay will be equipped with new Air Insulated Switchgear (AIS) equipment, similar to other bays in the substation. This AIS equipment will consist of busbar disconnectors, circuit breakers, instrument transformers, transformer disconnectors, surge arresters, post insulators and tubular aluminium busbar. AIS is high voltage electrical equipment which uses the open air as its insulating medium. Live conductors are typically mounted outdoors on porcelain insulators on steel supports (refer to Figure 3.1)

Figure 3.1: Typical AIS Equipment

Source: Mott MacDonald

The single 400 kV cable circuit option will consist of three power cables (one cable per phase) and a single fibre optic link entering from the public road to the south into the ESB owned substation from which it will connect to the grid via the existing 220 kV busbar. One or more bunded transformers will be installed to 'step down' the voltage level of the 400 kV cable circuit to match the voltage level of the existing 220 kV busbar. The 400 kV bay, fitted out with 400 kV AIS equipment, will be installed within the existing footprint of the substation.

The proposed development at the connection point will be accommodated within the existing fence line of Knockraha substation.

3.1.1.2 Laying of Underground Cable

As detailed previously, the Celtic interconnector will connect to the Irish electricity transmission system at the connection point at Knockraha substation via a HVAC underground cable. AC is the technology utilised on the Irish electricity transmission network.

In contrast, electricity is best carried over long distances by means of HVDC technology. As such, a HVDC submarine cable will connect to a HVDC onshore underground cable at a TJB north of the car park at Claycastle Beach near Youghal in County Cork.

The majority of the HVAC and HVDC underground cables (UGCs) will be installed within the existing public road network. Off-road (cross-country) routes are proposed at particular locations to avoid constraints. These locations include:

- North of Claycastle Beach where, due to structural constraints associated with an existing narrow railway bridge, it is necessary to divert the UGC off road for approximately 241 metres in the area of, and under, the planned Midleton to Youghal Greenway (currently under construction). Approximately 65 metres of the 241 metres of land cable for this off-

road section will be installed within Ballyvergan Marsh proposed Natural Heritage Area (pNHA (site code 000078).

- The villages of Killeagh and Castlemartyr will be avoided by means of cross-country routing; this will minimise disruption and nuisance for these villages, their residents and communities, and for traffic passing through the villages which are both located on the N25 Cork-Waterford-Wexford / Rosslare National route.

The HVAC and the HVDC UGCs will terminate at the converter station site compound described.

Laydown areas, where construction materials can be temporarily stored, and construction compounds, where welfare facilities can be provided, will also be required along the route.

Joint Bays

The cable will be delivered to site on drums. Joint bays will be required to be installed along the cable route to join consecutive lengths of cable and to facilitate cable pulling. These are underground chambers which are used as the location to pull the various lengths of UGC through pre-installed ducts, and to connect ("Joint") together those lengths of UGC into a single overall circuit. Typically, joint bay separation is between 500m and 850m, depending on the cable supplier, with all joint bays being located with the cable corridor. A 400kV joint bay is typically 6m x 3m.

Provision will also be made for the installation of (C2) communications chambers and link box chambers at various joint bay locations. The C2 chamber is used to join the fibre optic communications cable and the link box chambers are used to accommodate the link box, which earths the outer sheaths of the power cables.

The chambers are provided with removable lids and access to the chambers will be required on a permanent basis to facilitate maintenance. Typically, these chambers are located within the verge to minimise traffic disruption during routine maintenance.

Joint bays are not readily accessible during operation as there is no ongoing maintenance required; however, they need to be immediately accessible in the unlikely event of cable failure requiring cable replacement. The extent to which traffic management or other measures would be required in this situation will depend on the location of the joint bay within the roadway.

An image of a HVAC joint bay is presented in Figure 3.2. An image of a joint bay with the link box and communications chamber visible is provided in Figure 3.3. An extract from a drawing showing the scale of the link box and communications chamber relative to the joint bay is shown in Figure 3.4.

To facilitate traffic management at locations where joint bays are located within the carriageway, the use of temporary passing bays is proposed.

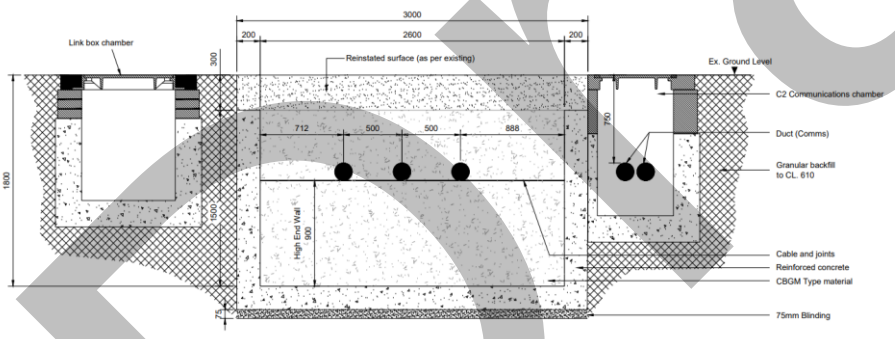
Figure 3.2: HVAC joint bay with one cable pulled

Source: EirGrid

Figure 3.3: Joint bay with link box and communications chamber shown

Source: Mott MacDonald

Figure 3.4: Typical joint bay drawing showing scale of link box and communications chambers



Source: Mott MacDonald

HVAC / HVDC Underground Cable

In general, and wherever possible, the UGC will be pulled into pre-installed ducts laid within a trench. The installation conditions of the cable, including depth, affect its performance.

The standard trench dimensions for a (400 kV) HVAC route is approximately 0.8m wide x 1.5m deep.

The standard trench dimensions for a HVDC route is approximately 0.8m wide x 1.3m deep.

These dimensions are based on a standard arrangement within the public roadway. In open land, for cross country routing, space is relatively unconstrained. Additional space may however

be required for route alignment to avoid underground objects such as tree roots or other unidentified obstructions that cannot be removed.

The final specific trench dimensions will be confirmed at detailed design stage.

A trench will be opened, the ducts installed in the correct arrangement and the trench will be backfilled with suitable back-fill material and marker boards for protection. Following duct installation, the road above the trench will be reinstated to match the environment in which it is installed to the standard required by the relevant authority at that location, in this case Cork County Council and / or TII. Figure 3.5 shows a typical trench in a public road for a pair of HVDC cables after installation of ducts and prior to back fill. Marker boards can be seen within the trench prior to final reinstatement.

Cable is manufactured and delivered to site on drums, in lengths of approximately 750 to 1000 metres, requiring the installation of joint bays to join consecutive lengths of cable together.

Figure 3.5: Typical HVDC Cable Trench in Road

Source: EirGrid

A number of crossings of watercourses, drainage ditches, utilities, railway lines and the Midleton to Youghal Greenway will also be required along the cable route. These crossings will be facilitated by either open cut trenching or by use of Horizontal Directional Drilling (HDD) as and when appropriate.

3.1.1.3 Converter Station

Converter Station Building

Due to the ground conditions on the Ballyadam site, it is likely that rotary bored cast-in-place reinforced concrete piles socketed into rock will be adopted for all foundations on this site.

The converter station compound and ESB substation will measure approximately 3.6 hectares. The converter station compound will measure approximately 250m x 150m and will include three main buildings, up to 25m in height, outdoor equipment including 400 kV AIS equipment and four bunded transformers.

The key components of the proposed converter station and compound comprise:

- Main converter building;

- Control building;
- Storage buildings;
- Valve cooler area;
- Harmonic filter compound;
- Reactive compensation compound;
- Lightning protection poles;
- Lighting poles;
- Interface kiosk;
- Property fence / gates;
- Palisade fence / gates;
- Security lighting;
- Compound and control building for Transmission Asset Owner (TAO; i.e. ESB);
- Storm water drainage / Sustainable Urban Drainage System (SuDS) including below ground storage attenuation tanks;
- Landscaping and other associated finishing works; and
- Internal roads and access.

The main converter building will comprise a single storey structure divided into three halls; a reactor hall, a valve hall and a DC Hall.

The control room will house the auxiliary services equipment, such as control and telecoms equipment, low voltage switchgear, and emergency diesel generator, batteries and welfare facilities (i.e. toilets, messroom, etc.).

A below ground earth grid will be installed in a grid arrangement approximately 600mm below the finished surface. The earth grid will consist of a 95mm^2 bare stranded copper conductor. The purpose of the earth grid is to ensure personnel and public safety during electrical faults that may occur on the transmission grid.

Fencing around the entire converter station compound, with the exception of the site entrances gates, will comprise external 1.4m high post-and-rail property fencing and internal 2.6m high galvanised steel palisade fencing.

Water Supply

The proposed converter station will require a clean water supply for both fire-fighting and welfare purposes (i.e. hand-washing, toilet flushing etc.).

Due to the ‘unmanned’ nature of the proposed development, there will be no demand for water at the site during a typical week. Demand for water will arise however when personnel are present on site to carry out periodic inspections or maintenance work and the peak demand during this period has been estimated at 675 l/week based on the following assumptions:

- 4 No. person crew on-site for a total of 3 days;
- Per-capita demand of 45 litres per day and a peaking factor of 1.25 applied in line with Irish Water standards;
- No urinals or automatic flushing mechanisms in place; and,
- Taps incorporate automatic shut-off mechanisms.

Although records indicate that there are numerous water supply pipelines within the Ballyadam area, the IDA landholding, including the site of the proposed converter station, is not currently serviced. Permission will therefore be sought from Irish Water for a new connection to an

existing 150mm watermain located in the local road which forms the western boundary of the overall IDA landholding.

Wastewater Drainage

The proposed converter station will require welfare facilities (toilets, wash-hand basins etc.) in a number of the buildings for use by staff when present on site.

As detailed above, the station will generally be 'unmanned, the peak loading during this period has therefore been estimated at 600 litres per week based on the following assumptions :

- 4 No. person crew on-site for a total of 3 days;
- Per-capita demand of 50 litres per day in line with Irish Water standards;
- No urinals or automatic flushing mechanisms in place; and
- Taps incorporate automatic shut-off mechanisms.

Records indicate that a 500mm diameter foul water drainage pipe has been laid in the south-west corner of the existing IDA site, presumably to facilitate connection to the public wastewater network by developers on the overall landholding. Due to the shallow depth of this pipe and the significant distance (>700m) between it and the proposed convertor station compound, it is not possible to achieve a gravity connection to this pipeline.

Although a connection could be achieved by installing a package pumping station to lift flows to the discharge point, this option is undesirable from cost and reliability perspectives due to the very low and intermittent volumes of wastewater flow expected to be generated at the site. It is instead proposed that wastewater is collected in proprietary holding tanks which will be periodically emptied by a licensed waste disposal contractor to licenced facilities. Separate holding tanks will be provided for control buildings located in the converter station and for those located in the reactor compound to facilitate separate billing.

Storm Water Drainage

Development of the proposed converter station will require existing permeable ground to be replaced with impermeable surfaces (roads, roofs, etc.) and this will result in a corresponding increase in storm water runoff during rainfall events.

To comply with established best practice, a storm water drainage system incorporating SuDS features will be constructed to manage the quantity and quality of runoff during rainfall events. The system will operate by gravity and be sized to ensure that no internal property flooding occurs for the critical storm with a 1 in 100-year return period including a +20% allowance for climate change.

The proposed storm water drainage / SuDS system will incorporate the following key features:

- Traditional storm water collection and conveyance elements such as gutters, downpipes, gullies, channels and below ground pipework;
- Flow control devices (e.g. 'hydrobrake' or equivalent) to restrict the rate of discharge from the site to greenfield runoff rates;
- Below ground attenuation tanks to balance incoming flows and prevent flooding in the event of an extreme storm event;
- Silt traps and hydrocarbon interceptors to remove any pollutants which may have become entrained in the runoff; and,
- Shut-off valve chambers to prevent discharge from the drainage network in the event of an emergency.

All proposed surfaces and storm water drainage elements will be sealed to protect the soluble karst rock beneath the site.

Runoff is proposed to be discharged to an existing 600mm diameter storm water drainage pipe which has been laid in the south-west corner of the existing IDA site. This 600mm pipe is part of to the public storm water drainage system which serves the Carrigtwohill area and which discharges to 'Slatty Water' via Annagrove Stream.

Compensatory Storage

The existing lands within the footprint of the proposed convertor station include two large depressions which are understood to have been formed during undertaking of the previously permitted site development works. The previously permitted development was subsequently abandoned but these excavations were never backfilled.

The depressions have a combined area of approximately 20,000m^2 and are between 2.5 and 3m in depth. They will need to be backfilled with suitable material in order to provide a stable foundation for the proposed convertor station compound.

This compensatory storage area will consist of a below ground and covered storage tank, which will be emptied at a controlled rate via a pumped connection to the storm water drainage system which will serve the proposed converter station access road. Discharge from the compensatory storage area will be restricted to greenfield runoff rates to ensure that there is no significant increase in flood risk elsewhere.

Flood water routing in the form of open channel drains and culverts will be installed around the perimeter of the proposed converter station to divert overland flow towards the dedicated compensatory storage area, rather than towards the location of the infilled depressions.

Site Access Roads

The proposed internal access road for the converter station site has been developed during detailed engagement with the IDA and its consultants to tie into the existing internal roads within the larger IDA landholding. This proposed internal access road has been developed independent of any potential future access routes to the Ballyadam site (including a potential N25 interchange to the south west). The design can however readily connect into such proposals in the future, in the context of the anticipated evolution of the overall IDA Ballyadam landholding as an industrial/employment node, without affecting the conclusions of this EIAR.

The internal access road is proposed to be a paved 8m wide two lane single carriageway with pathways each side. The road construction will consist of flexible pavement layers and relevant sub-base and capping layers.

The Irish landfall construction works will be progressed in two phases, to mitigate beach access restrictions and disturbance at the caravan park during the busy summer months. There are two options for landfall construction with varying levels of impact in terms of access restrictions and disturbance. Option 1 has the greater potential for impact and so is the basis for assessment.

Phase 1 will be conducted in the winter months (i.e. October to April inclusive) and will consist of the construction of the transition joint bay (TJB) and communication chambers, and the installation of the cable ducts within open cut trenches up the beach and into the beach car park. The areas will then be reinstated to their original condition prior to completion of this Phase. The estimated duration of the works is approximately ten weeks.

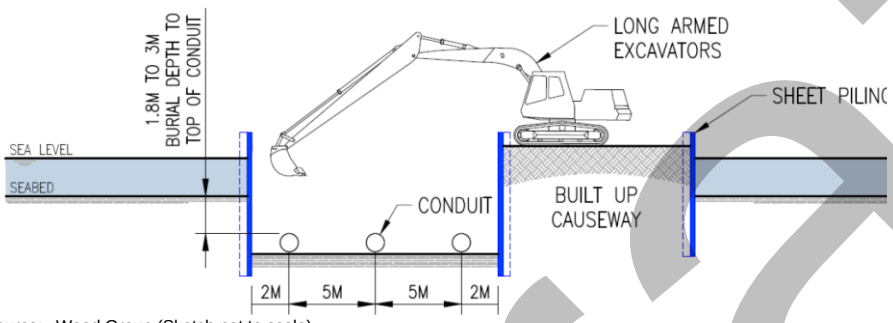
Phase 2 will be conducted in the summer months and will consist of the installation of the cables through the Phase 1 ducts. This will be achieved by pulling the cables from the cable lay

vessel through the ducts by means of a cable winch located within the TJB chambers. The estimated duration of the works is approximately four weeks.

3.1.1.4 Landfall Construction

The cable ducts will be placed within excavated trenches up the beach from the sea to the TJB chambers. The excavation into the intertidal zone will require the temporary construction of a causeway, to form a stable platform from which excavators can work freely above the tidal zones. The platform and the trench excavation will be formed by a cofferdam (sheet piling) to mitigate against sea erosion during the winter months.

Figure 3.6: Typical Temporary Works for the Excavation and Causeway



Source: Wood Group (Sketch not to scale)

A portion of the trench route will pass below the carpark necessitating its temporary closure during phase 1 (winter months). These works can be conducted using conventional excavating machines and methods.

Phase One Installation

The first phase 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. A temporary sheet piled cofferdam will be required (for Option 1) to ensure trench stability and an adjacent temporary causeway will be required for access. The trench will be backfilled, and the site will be reinstated to its original condition following phase one installation (approximately 10 weeks).

Temporary sheet pilling (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 seawater and sediments. The steel sheet-piles will be installed using a pilling rig comprising hydraulic vibratory hammers. The piling rig will typically work from the beach outward, using the formed temporary causeway as an access route.

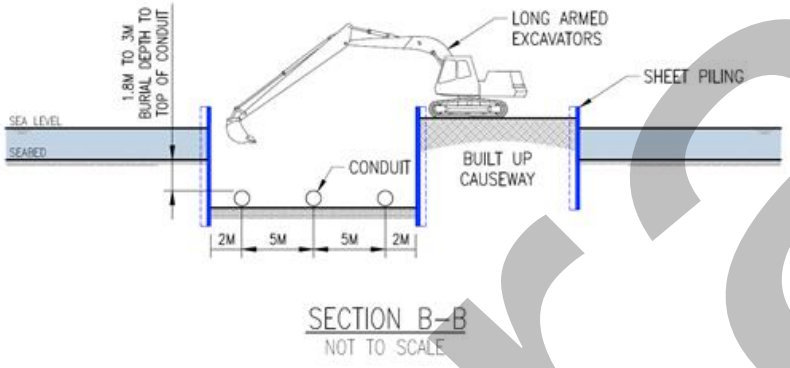
The cofferdam will be approximately 130m long and formed from two lines of sheet piles installed parallel to the centreline of the conduits. The cofferdam will also be enclosed by sheet piles at its offshore end. With the conduits installed at a 5m spacing between centres, a 14m wide cofferdam is conservatively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

It is assumed that 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 8.0m wide causeway (est. 6000m3) is assumed to be sufficient. The temporary causeway will 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 would not require a causeway and the cofferdam would be much reduced in length, approximately 5m).

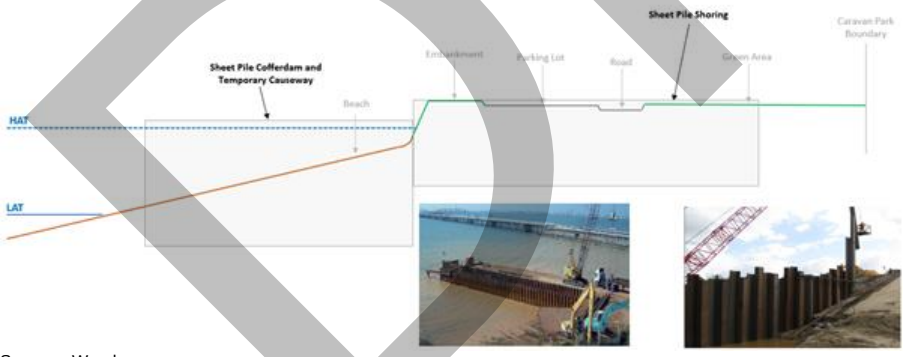
The proposed offshore trench, cofferdam and temporary causeway for Option 1 are illustrated in Figure 3.7 and Figure 3.8.

Figure 3.7: Temporary Works (Trench, Cofferdam, Causeway (Not to Scale)]



Source: Wood

Figure 3.8: Temporary Works (Cofferdam and Causeway Construction)



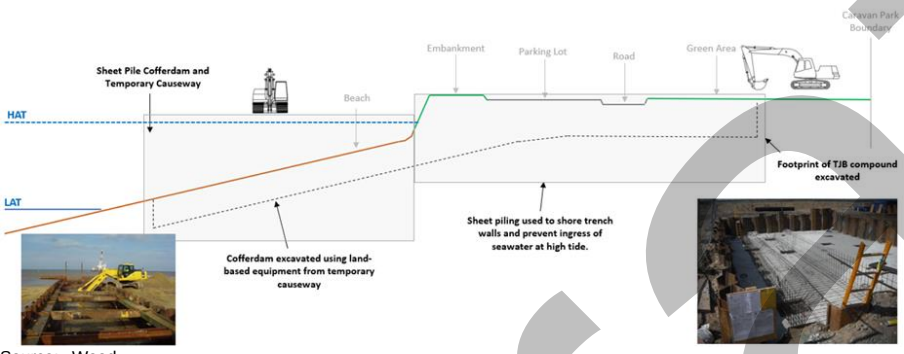
Source: Wood

Following installation of the temporary cofferdam the trench will 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 3.9provides a sketch of this phase of

installation. Spoil material from the trench (est. 4000m^3) will 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 will be adequately covered to prevent exposure to the elements.

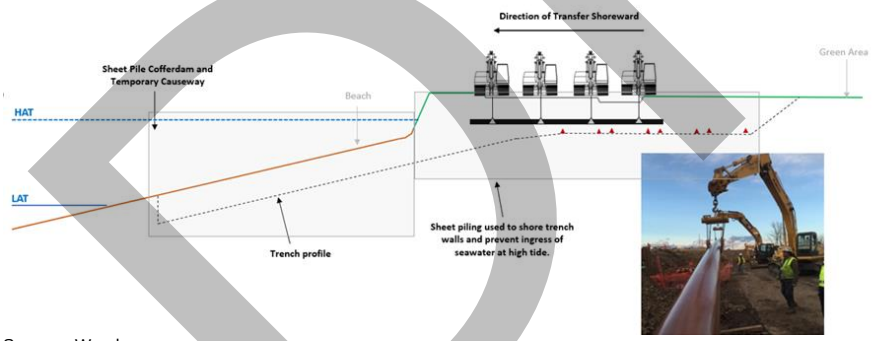
Following completion of the trench the conduits will be transported from a staging area located in the hard standing car park within the construction compound and will be laid above ground in the trench on top of support structures such as sandbags, trestles, and plinths. Conduit pipe segments (3m-5m) will be strung together by welding to form the conduit pipe string and transferred shoreward using lifting machinery as shown in Figure 3.10

Figure 3.9: Temporary Works – Trench Excavation



Source: Wood

Figure 3.10: Temporary Works – Conduit installation



Source: Wood

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.

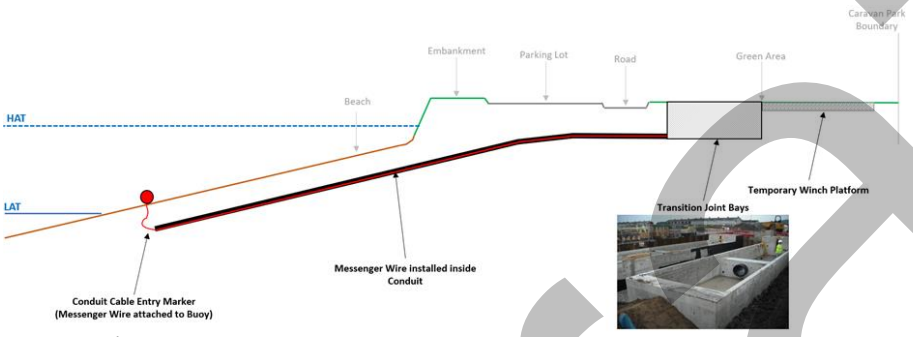
A temporary winch platform will be required for phase two. The temporary winch platform will be established on the shore side of the TJB in order to pull the cables through the conduits and into

the TJB. It is proposed to construct this platform during phase one to minimise disruption to third parties in phase two.

It is assumed that a 20m x 20m winch platform will be sufficient for this operation. The platform will be of hard standing, typically compacted aggregate. The platform will be level; however, a slight sloping angle may be advantageous for cable vertical alignment during the pull operations and to manage surface water drainage.

Figure 3.11 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 3.11: Phase One Post-Construction



Source: Wood

Phase Two Installation

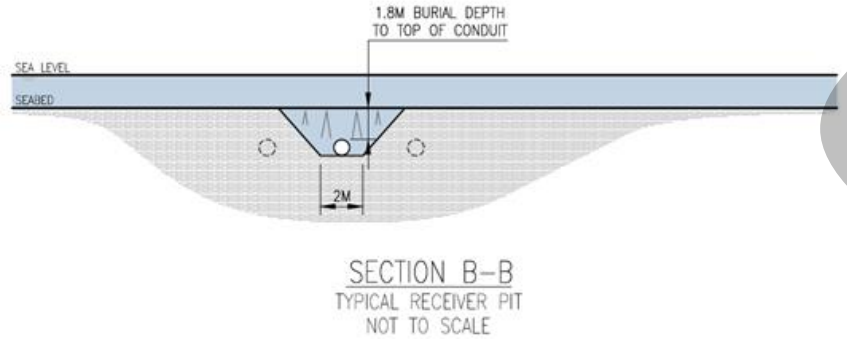
The second phase of the installation sequence involves pull-in of the offshore cables through the pre-installed conduits and into the TJB using a cable winch spread. The location of the receiver pit will vary between Option 1 and Option 2, however, all other activities are similar. Option 2 would require 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 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 3.12

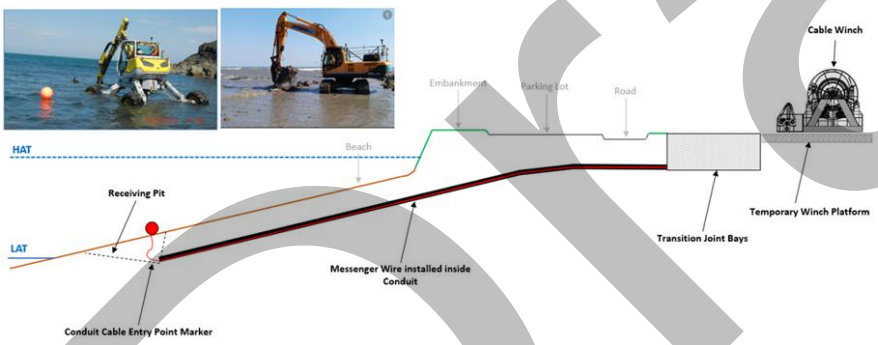
Figure 3.12: Temporary Works (Cable Conduit Entry Excavation)



Source: Wood

A cable winch will be installed on the temporary plinth located behind the TJB. The onshore end of the messenger wire shall be retrieved from the TJB and connected to the cable winch wire. Figure 3.13 shows the arrangement once the cable winch has been installed.

Figure 3.13: Temporary Works (Cable Winch installed)

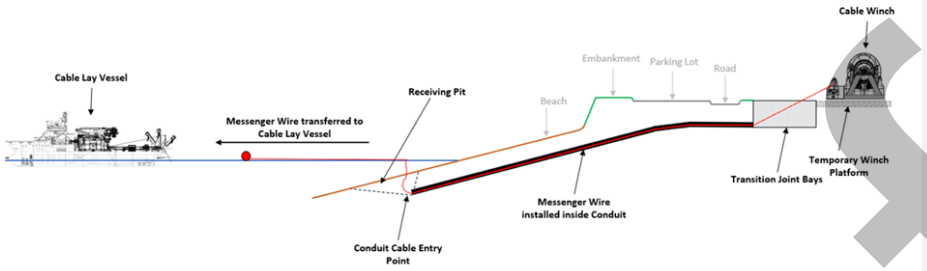


Source: Wood

The submarine cables will arrive on site aboard a cable lay vessel. The messenger wire will be transferred to the cable lay vessel for connection to the end of the submarine cable as shown in Figure 3.14

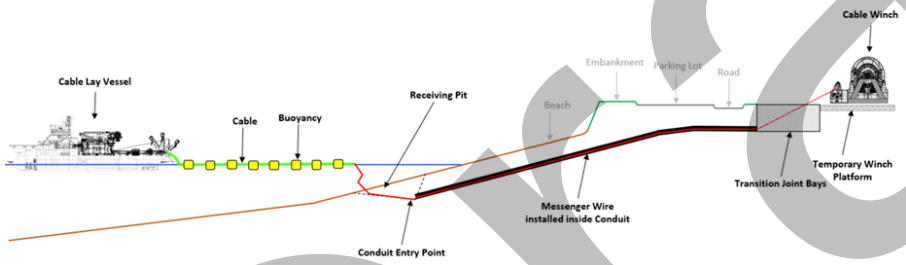
The submarine cable is then floated / pulled onto shore with the aid of temporary buoyancy aids which are removed prior to pull into the conduit. The temporary buoyancy aids are retrieved by the cable lay vessel as shown in Figure 3.15 The winch is used to pull the cable ends up to the TJB. Once the cable is secured in the TJB, the offshore cable lay and burial process will commence. For this, a plough / jetter will 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 3.16.

Figure 3.14: Messenger Wire Transfer to Cable Lay vessel



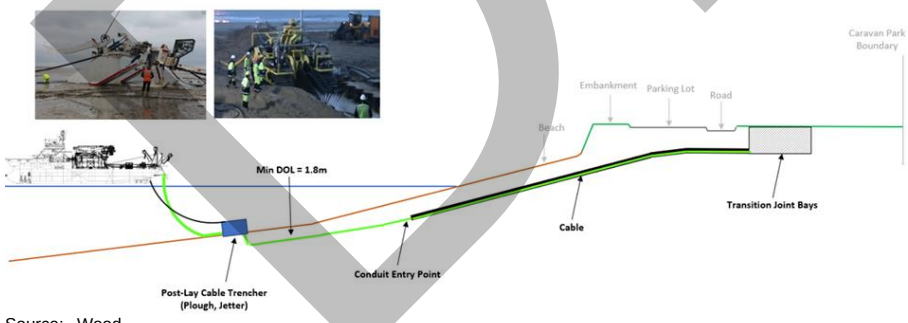
Source: Wood

Figure 3.15: Submarine Cable floated to Shore



Source: Wood

Figure 3.16: Post-Construction



Source: Wood

Landfall Transition Joint Bay Chambers

The submarine cables will be jointed with the land cable within underground TJB chambers. The chambers will have approximate plan dimensions of 15m x 4m x 3m deep and will be installed behind the landfall area at Claycastle Beach. Such chambers generally consist of reinforced concrete base slab and walls. The chamber is then typically backfilled with a suitable material (such as cement bound sand) following installation of the cable joints. The top layer can then be backfilled. It is estimated that construction of the transition joint bay chambers will take approximately 18 weeks and will commence at the beginning of Phase 1 activities, as appropriate, having regard to any seasonal constraints that may apply.

The extent of the area required for the joint bay chamber construction works will be minimised as much as possible to limit potential access restrictions for the public to the carpark.

Temporary Laydown Areas

All temporary laydown areas will be secured with hoarding / fencing around their perimeter as appropriate.

Where an access road is required, engineering stone fill will be laid and compacted and maintained as required for the duration of the works. Once the works are completed, the engineered stone fill will be removed and the land will be reinstated to its original condition.

All construction workers will be directed to use the designated access / egress routes only.

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

Security lighting will be directional and cowled, away from vegetated areas and wetlands.

Temporary Construction Compounds

Temporary construction compounds will be required at the connection point (Knockraha substation), the converter station (Ballyadam) and the landfall (Claycastle). Final agreement of specific locations of these compounds will be a matter for the appointed contractor with the planning authority.

All temporary construction compounds will be secured with hoarding / fencing around the compound perimeters as appropriate. Where temporary construction areas are required and existing hardstanding is not available, engineering stone fill will be laid and compacted and maintained as required for the duration of the works.

All construction workers will be directed to use the designated access / egress routes only.

Temporary facilities will be provided which will include construction phase car parking and welfare facilities and temporary material storage areas as necessary. Any discharges from temporary welfare facilities will be connected to a sealed holding tank to be emptied and disposed of off-site by a licenced contractor to an approved licenced facility.

3.1.2 Operational Phase Activities

Converter Station

The converter station does not require any full-time personnel for operation. Two types of maintenance regimes will be required on an annual basis for the converter station, namely scheduled and unscheduled maintenance.

Scheduled maintenance of the converter station will occur once a year and take approximately three days for a crew of four personnel. The HVDC link will need to be taken offline for essential

maintenance during this time. This maintenance will involve replacement of faulted power electronic equipment, replacement of faulted fibre optic links, general cleaning of HV areas and visual inspection of HV plant.

Typically, every five years, during this scheduled maintenance, more invasive maintenance works will be required for works such as transformer taps cleaning and switchgear cleaning.

Unscheduled maintenance of the converter station will typically occur at unknown times throughout the year and, it is assumed for the purpose of this EIAR, will lead to loss of operation for approximately 3 days per annum to repair and / or replace faulted equipment. Unscheduled maintenance occurs due to unforeseen trips and emergency outages, but these will be infrequent.

3.1.3 Decommissioning Phase Activities

The operational life of the equipment and apparatus of the Celtic Interconnector is expected to be 40 years. Thereafter, it is assumed that the equipment will be decommissioned and replaced with new equipment.

The HVAC and HVDC 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. All equipment for the converter station will be removed for recycling or disposal as required by the regulations are the time.

3.1.4 Summary of potential for impacts.

In the absence of mitigation measures, there is the potential for the following impacts.

Construction Phase:

- Potential for direct impact to habitats and species within the footprint of the Proposed Development.
- Potential for indirect impact to habitats and species within the vicinity / downstream of the proposed of the Proposed Development.
- Potential for generation of dust
- Potential for generation of surface-water pollution/sedimentation.
- Potential for noise and vibration effects.

Operational Phase:

- Given the nature of the works required at the operational phase, none anticipated.

Decommissioning phase:

- As per construction phase.

3.2 Description of the Receiving Environment

3.2.1 Habitats Within the Footprint of the Development

The habitat types associated with the footprint of the development are described in section 2.2 As has already been confirmed, none of the proposed development site overlaps or adjoins European sites. The majority of the cable route lies within the existing roadways and improved agricultural grassland.

3.2.1.1 Watercourses.

Table 3.1 presents an overview of WFD surface waterbodies within or in close proximity to the proposed development, as detailed on EPA datasets and mapping. The following detail is provided:

- WFD surface waterbody water crossings (denoted as 0m distance) and WFD surface waterbodies within 500 metres of the proposed development (closest distance provided);
- River waterbody WFD status 2013-2018;
- EPA name for surface waterbody;
- Summary of aquatic ecology evaluation

Table 3.1: Receiving Environment

Route Section Name [6]	WFD Waterbodies (WFD Status 2013-2018) and proximity to the works	Name (EPA)	Summary of Aquatic Survey Findings (Triturus 2021)
Connection Point	None. The closest known waterbody to the proposed works at Knockraha substation is Lisheenroe Stream, a tributary of the Butlerstown River, located approximately 650m east of the proposed construction compound	Not Applicable	Not applicable
AC01-AC02	BUTLERSTOWN_030 (Good) ca. 50m distance	Lisheenroe (EPA code: 19L40)	Suitable habitat for salmonids identified
AC02-AC03	BUTLERSTOWN_030 (Good) - 0m distance Unnamed drainage ditch - - 0m distance	Lisheenroe (EPA code: 19L40)	Suitable habitat for salmonids identified
AC03-AC04	OWENNACURRA_030 (Good) ca. 370m Tibbotstown_010 (Unassigned)- ca 45m Unnamed drainage ditch - 0m distance	Tibbotstown (EPA code: 19T25)	Owennacurra: Suitable habitat for salmonids present, record of lamprey Tibbotstown: Semi dry, lack of suitable fisheries habitat Unnamed drainage ditch: Not surveyed
AC04-AC05	Unnamed drainage ditch 0m distance	Not Applicable	Not surveyed
AC05-AC06	Unnamed drainage ditch x 2 0m distance	Not Applicable	Not surveyed
Converter Station	Two existing depressions within the converter station compound footprint currently collect rainwater Two infilled unnamed lakes ca.50 metres from the proposed access routes	Not Applicable	Not surveyed, note no connectivity to river waterbodies
DC01-DC02	OWENNACURRA_030 (Good) 0m distance OWENNACURRA_040 (Moderate) ca. 25m distance Unnamed drainage ditch x 3 0m distance	Owennacurra (EPA code: 19O03) / 19O03	Owenacurra River: Suitable habitat for salmonids. Lamprey, and otter present Unnamed drainage ditch: Not surveyed
DC02-DC03	Two river crossings (OWENNACURRA_040) (Moderate) 0m distance	Glenathonacash (EPA code: 19G66), Elfordstown (EPA CODE: 19E02)	Owennacurra: Suitable habitat for salmonids. lamprey. Otter known to be present.

[6] Section labels are indicated in mapping provided in Appendix C

Route Section Name [6]	WFD Waterbodies (WFD Status 2013-2018) and proximity to the works	Name (EPA)	Summary of Aquatic Survey Findings (Triturus 2021)
			Glenathonocash River: Salmonids, lamprey, & otter present Elfordstown River: Salmonids present; lamprey habitat present
DC03-DC04	Two river crossings. OWENNACURRA_040 (Moderate) and DUNGOURNEY_020 (Poor) 0m distance	Dungourney 19 (EPA CODE: 19D07). Elfordstown (EPA CODE: 19E02)	Owennacurra: Suitable habitat for salmonids, and lamprey. Otter known to be present. Dungourney: Suitable habitat for salmonids, and lamprey
DC04-DC05	DUNGOURNEY_020 (Poor) ca. 30m distance Unnamed drainage ditch	Harrisgrove (EPA code: 19H02)	Low fisheries value.
DC05-DC06	Loughs Aderry and Ballybutler pNHA pNHA boundary within N25. Lough Aderry ca. 15m distance DUNGOURNEY_020 (Poor) ca. 100m distance Unnamed drainage ditch x 2. 0m distance	Harrisgrove (EPA code: 19H02) Loughs Aderry (EPA code: 19_65)	Harrisgrove: Low fisheries value Loughs Aderry: Low fisheries value in the context of QI species Unnamed drainage ditch not surveyed
DC06-DC07	WOMANAGH_010 (Moderate) 0m distance Clasharinka Pond pNHA boundary within N25 WOMANAGH_020 (Good) ca 105m distance Unnamed drainage ditch 0m distance	Womanagh (EPA code: 19W01)	Womanagh River: Salmonids present; lamprey, & otter habitat present. Clarashinka Pond: not surveyd Unnamed Drainage ditch: Not surveyed
DC07-DC08	Two Crossings. WOMANAGH_020 (Good) MOANLAHAN_010 (Unassigned) 0m distance Clasharinka Pond pNHA boundary within N25	Annistown (EPA code: 19A24) Moanlahan (EPA code: 19M29)	Annistown Stream: Stream 100% dry at time of survey Moanlahan River: Low fisheries value Clarashinka Pond: not surveyd
DC08-DC09	Two river crossings for each DISSOUR_020 (Good) 0m distance	Dissour (EPA code: 19D03) / Inchanapisha (EPA code: 19I19)	Dissour River: Salmonids present; lamprey, and otter habitat present Inchanapisha River: Good salmonid nursery habitat

Route Section Name [6]	WFD Waterbodies (WFD Status 2013-2018) and proximity to the works	Name (EPA)	Summary of Aquatic Survey Findings (Triturus 2021)
DC09-DC010	Four Crossings. DISSOUR_020 (Good). WOMANAGH_030 (Unassigned x 2). East Ballyvergan_010 (Unassigned) 0m distance Ballyvergan Marsh pNHA (000078) boundary along R634 0m distance	Lagile (Epa Code: 19l47) Gortnagark (Epa Code: 19g72) Inchiquin (Epa Code: 19i14) East Ballyvergan (Epa Code: 19e04)	Salmonids present; lamprey, eel & otter habitat present (Inchiquin stream) Lagile Stream and Gortnagark Stream: No findings relevant to QI species Inchiquin Stream: Salmonids present; lamprey, and otter habitat present East Ballyvergan Stream: Low fisheries value
DC10-DC011	East Ballyvergan_010 (Unassigned) ca. 180m distance Ballyvergan Marsh pNHA (000078) boundary along R634 0m distance Ballvergan Marsh Bird Pond ca. 145m distance	Pipersbog (EPA code: 19P09)	Not surveyed
DC11-DC012	Unnamed drainage ditch 0m distance Ballyvergan Marsh pNHA (000078) 0m distance	Not Applicable	Not surveyed
Landfall	Youghal Bay (Moderate) Excellent Bathing Water Quality 0m distance Large unnamed (saline) drain within Ballyvergan Marsh pNHA (000078) to west of car park ca. 190 metres	Youghal Bay	Coastal waters – not surveyed as part of aquatic survey

3.2.2 Invasive Species

The following Third Schedule invasive species were recorded:

- Japanese knotweed (*Fallopia japonica*) (Figure 3.17: Japanese Knotweed along Dissour River)
- Himalayan balsam (*Impatiens glandulifera*) (Figure 3.18)
- Sea buckthorn (*Hippophae rhamnoides)* (Figure 3.19)
- American mink (*Neovison vison*) (Figure 3.20)
- Three cornered leek (*Allium triquetrum*)

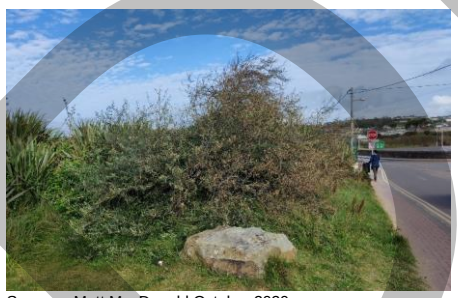
Figure 3.17: Japanese Knotweed along Dissour River

Source: Mott MacDonald September 2020

Figure 3.18: Himalayan Balsam Plants Along Owennacurra River

Source: Mott MacDonald October 2020

Figure 3.19: Sea Buckthorn at Claycastle



Source: Mott MacDonald October 2020

Figure 3.20: Mink Recorded Close to Owenacurra River

Source: Mott MacDonald November 2020

The locations of these species relative to the proposed development are outline in Table 3.2 hereunder.

Table 3.2: Locations of Invasive Species Stands

Location	Invasive Species Recorded	Notes
Knockraha Substation	None	-
AC01-AC02	None	-
AC02-AC03	None	-
AC03-AC04	None	-
AC04-AC05	None	-
AC05-AC06	Japanese knotweed	• Single roadside stand, potentially will affected by cable
Converter Station Site	None	
DC01-DC02	Himalayan balsam	• Numerous plants growing along the riverbank both upstream and downstream of the Owennacurra river crossing. Potentially will be affected by cable.
DC02-DC03	Japanese knotweed American mink	• Extensive stand of knotweed located on roadside. Appears to be under treatment by the council. Outside of works area. • American mink recorded during trail camera survey
DC03-DC04	None	-
DC04-DC05	None	-
DC05-DC06	None	-
DC06-DC07B	None	-
DC07-DC08	None	-
DC08-DC09B	Japanese knotweed	• Multiple significant untreated stands of knotweed along the banks of the river Dissour and along field boundaries. Does not appear to be under treatment. Potentially affected by cable.
DC09-DC10	None	-
DC11-DC12	Japanese knotweed	• Stand within an area of scrub in Ballyvergan marsh. Appears to be undergoing treatment, bonsai growth evident. Outside of works area.
Claycastle Landfall	Sea buckthorn	• Single stand within a planted border. Outside of works area.

While American mink is listed as an invasive species, there is no potential for the works to result in the spread of the species. It is therefore, not considered further in the context of this document.

The locations of these stands are presented in Appendix B.

3.2.3 Wintering Birds

Loughs Aderry and Ballybutler pNHA

The site synopsis for the Lough Aderry and Ballybutler pNHA (NPWS 1997) notes that the site supports nationally important numbers of gadwell along with a variety of waterfowl including mute swan, wigeon, teal, mallard, shoveler, pochard (*Aythya farina*), coot (*Fulica atra*) and lapwing (*Vanellus vanellus*). The proposed cable route runs along the northern section of the site at DC05 to DC06. Associations of these species to nearby SPAs is outlined below in Table 3.3.

Table 3.3: Bird Species associated with Lough Aderry and Ballybutler pNHA

Species	SCI of Ballymacoda SPA	SCI of Blackwater Estuary SPA	SCI of Cork Harbour SPA
Gadwell	-	-	-
Lapwing	✓	✓	✓
Mallard	-	-	-
Mute swan	-	-	-
Pochard	-	-	-
Teal	✓	-	✓
Wigeon	✓	✓	✓

It is of note that the northern boundary of the pNHA adjoins the existing N25 roadway. This is a very busy road that links Castlemartyr and Midleton towns. As such, the northern boundary and nearby areas of the site are subject to significant noise disturbance throughout the year. However, while birds are likely to habituate to regular on-going noise disturbance, impulsive noise sources as might be produced during construction phase works have the potential to cause localised disturbance.

Wintering Bird Surveys 2019

Specialist wintering bird surveys were carried out by Glas Ecology in 2019 at Redbarn/ Claycastle Beach and Ballyvergan Marsh located in the footprint of the landfall location and first 1km of the cable route respectively.

Counts were conducted at Redbarn/Claycastle on the 18th of February and 4th of March 2019. The full results of the surveys are summarised hereunder in the context of nearby European sites.

The survey scope included recording SCI wintering bird species associated with SPA's. Peak numbers of wintering wildfowl, wader and gull species recorded are outlined in Table 3.4 below.

Table 3.4: Peak numbers (High and Low Tide) from February-March 2019 ('Late Winter')

Species	Conservation Status (Colhoun and Cummins, 2013)[7]	SCI of Ballymacoda SPA	SCI of Blackwater Estuary SPA	SCI of Cork Harbour SPA	Peak Number (H=High; L=Low; S =At Sea)	Figure of National Significance	Peak as % of Figure of National Significance
Bar-tailed godwit	Amber	✓	✓	✓	6 (L)	170	4%
Black-headed gull	Red	✓	-	✓	22 (L)	1000	2%
Common gull	Amber	✓	-	✓	19 (L)	500	4%
Cormorant	Amber	-	-	✓	1 (H)	110	1%
Curlew	Red	✓	✓	✓	57 (H)	350	16%
Grey Heron	Green	-	-	✓	1(L)	105	1%
Herring gull	Red	-	-	-	23 (L)	500	5%
Oystercatcher	Amber	-	-	✓	43 (L)	610	7%
Redshank	Red	✓	✓	✓	1 (L)	240	<<1%
Sanderling	Green	✓	-	-	**117 (L)**	**85**	**138%**

The table shows that 10 SCI bird species were recorded that are associated with SPA's. All were recorded in relatively low numbers except Sanderling. Peak numbers of Sanderling exceeded the figure for national significance.

Roosting Hen Harrier were recorded using the Ballyvergan Marsh. This confirms that this site continues to be an important roost area for hen harrier

A summary of wintering bird surveys results undertaken within the Converter Station Site, at Ballyvergan Marsh, and at Claycastle Beach are outlined hereunder in the context of nearby SPAs and associated SCIs. Figures outlining the survey areas are provided in Section 1.6.

Redbarn-Claycastle

Peak numbers of bird species which may be associated with nearby SPAs recorded at high and low tide counts results at Redbarn-Claycastle are outlined in Table 3.5 below.

[7] Colhoun K. & Cummins, S. 2013 Birds of Conservation Concern in Ireland 2014-19. Irish Birds 9:523-544

Table 3.5: Peak monthly high tide counts at Redbarn-Claycastle (beach, sea and fields) from November 2019 to March 2020

Species	Conservation Status (Colhoun and Cummins, 2013)	SCI of Ballymacoda SPA	SCI of Blackwater Estuary SPA	SCI of Cork harbour SPA	Peak Number (H=High; L=Low; S =At Sea)	Figure of National Significance	Peak as % of Figure of National Significance
Bar-tailed Godwit	Amber	✓	✓	✓	152 (L)	170	89%
Black-headed Gull	Red	✓	-	✓	38 (H)	1000	4%
Common Gull	Amber	✓	-	✓	88 (H)	500	18%
Cormorant	Amber	-	-	✓	4(S)	110	4%
Curlew	Red	✓	✓	✓	112 (H)	350	32%
Dunlin	Red	✓	✓	✓	1 (H)	460	<<1%
Grey Heron	Green	-	-	✓	1 (H)	25	4%
Grey Plover	Amber	✓	-	✓	4 (H)	30	13%
Oystercatcher	Amber	-	-	✓	126 (H)	610	20%
Redshank	Red	✓	✓	-	2 (H=L)	240	~1%
Ringed Plover	Amber	✓	-	-	40 (H)	120	33%
Sanderling	**Green**	✓	**-**	**--**	**159 (H) [during marine surveys]**	**85**	**187%**
Teal	Amber	✓	-		24 (H)	360	7%

Twelve SCI bird species of SPA's were recorded in 2020 surveys at Claycastle. Bar-tailed Godwit had the highest combined monthly total per species but this related to two large gatherings (152 and 71 in January and February respectively) in Section 1 and the species was not recorded in December and March. Sanderling, on the other hand, was recorded in each month averaging 43 per month during low tide counts. Species such as mute swan (*Cygnus olor*), mallard, teal, little egret, grey heron, water rail and most of the curlew were seen in Ballyvergan Marsh or the fields to the west of the marsh. Smaller numbers of black-headed, common and herring gull were recorded in most months, especially during the low tide counts.

No divers were recorded at Redbarn-Claycastle during the five months of winter surveys but two eiders (a scarce winter visitor to Cork) were recorded in January during the high tide count. Small numbers of Cormorant, Shag and Redshank were seen throughout the winter period. Grey Plover, Turnstone and Dunlin were each recorded on single occasions.

Marine Bird Surveys at Claycastle

A summary of monthly bird counts related to QIs of nearby SPAs is detailed in Table 3.6 below.

Table 3.6: Highest Daily Totals During Marine Bird Surveys at Claycastle from November 2019 and March 2020

Species	Conservation Status (Colhoun and Cummins, 2013)[8]	SCI of Ballymacoda SPA	SCI of Blackwater Estuary SPA	SCI of Cork harbour SPA	Highest Daily Totals
Black-headed Gull	Red	✓	-	✓	143
Common Gull	Amber	✓	-	✓	153
Cormorant	Amber	-	-	✓	13
Dunlin	Red	✓	✓	✓	21
Lesser Black-backed Gull	Amber	✓	-	✓	34
Oystercatcher	Amber	-	-	✓	36
Ringed Plover	Amber				12
Sanderling	**Green**	✓	**-**	**--**	**159**

Many of the species totals recorded above refer to multiple sightings of the same birds as they flew up and down the coast or remained within the survey area for several minutes and this was especially true of gulls. There was a distinct passage of birds flying northeast during the November survey and it is likely that the majority of sightings on that date refer to individual birds passing through the survey area.

A total of 15 species of waterbirds were seen during the surveys. Gulls were the most frequently recorded waterbirds and the six species recorded accounted for 79% of the sightings.

508 Herring Gull sightings accounted for 30% of the total and 353 Black-headed Gull sightings accounted for 21% of the total.

280 sightings of four species of wader accounted for just 16.67% of the total. Gannet, Cormorant and Shag sightings (37) accounted for 2.2% of the total. Only two species of wildfowl were recorded (Brent Goose and Common Scoter) and their combined totals accounted for just 1.7% of the total.

Bird sightings tended to be higher for most species (especially gulls) during the high tide counts Unusually large numbers of Black-headed Gull sightings (143) were notable in the December count. Exceptionally large numbers of Common Gull sightings (153) were recorded during the January count.

A comparatively large flock of Sanderling (159) was the most notable record in the March count and they remained on the beach close to the vantage point for most of the high tide count.

Summary

In summary, the peak counts over the survey season for individual species, during high and low tide counts, are outlined in Table 3.5 and Table 3.6. The Marine Bird Surveys (Table 3.7) data is not comparable however key information such as identified flock sizes is considered in this evaluation. Sanderling was the only species recorded that reached National thresholds (>1% national wintering population) of importance. The peak count of 159 sanderling was >3% of the

[8] Colhoun K. & Cummins, S. 2013 Birds of Conservation Concern in Ireland 2014-19. Irish Birds 9:523-544

National Population threshold (1% threshold = 85). A peak count of 152 Bar-Tailed Godwit is also very close to National Importance (1% threshold = 170).

Based on this information Claycastle Beach overall is an important location for wintering sanderling in particular (peak numbers exceeded national importance in both 2019 and 2020). The wider Claycastle beach area should be considered an ex situ site of local SPA's (Ballymacoda Bay and Blackwater estuary), given sanderling and other wintering birds will move between these sites over the course of a winter season.

Ballyadam/IDA site

Line transect counts following a circular path around the interior of the wider Ballydadam/ IDA site began in January and continued on a monthly basis through to March. A total of 32 species (all of them widespread and common) were recorded during the transects.

In summary the Ballyadams site had typical counts of common resident species. Small numbers of Snipe (Peak = 12) and Teal (Peak = 10) are noteworthy and likely include migrants from Europe/ Iceland which are potential SCI species of SPA's. These are common wintering species throughout Ireland.

In summary, typical common species were recorded and the overall Ballyadams area including the substation site is not a significant ex situ wintering bird site of any SPA.

Winter Roost Surveys – Ballyvergan Marsh

Winter raptor roost surveys recorded hen harriers on four of the five winter roost surveys between November and March. A minimum of two birds was seen on each of the months they were recorded and up to five were seen in November. Recording the exact number can sometimes be difficult as some birds alight after settling (often unnoticed) and may leave the roost site only to return again later. Three birds (all females or immatures) were seen together and it was thought that at least one and possibly two later sightings (females/immatures) were additional birds arriving after the first three had settled.

No birds were seen in December, but it is possible that birds either roosted earlier than usual or alternatively, birds were not seen as they flew in stealthily to roost. A minimum of two birds (adult male and female/immature) was seen in January and possibly a third bird (female/immature). Two birds, (adult male and female/immature) were recorded in February and a minimum of two birds (adult male and female/immature) were recorded in March. Peak counts of other species which may be associated with nearby SPAs encountered at Ballyvergan marsh are presented below in Table 3.7.

Table 3.7: Peak Counts of SCI Species Recorded During Hen Harrier Winter Roost Surveys at Ballyvergan Marsh

Species	Conservation Status (Colhoun and Cummins, 2013)[9]	SCI of Ballymacoda SPA	SCI of Blackwater Estuary SPA	SCI of Cork Harbour SPA	Peak Number Recorded	All Ireland Population	Figure of National Significance
Teal	Amber	✓	-	✓	1	35740	360
Grey heron	Green	-	-	✓	1	2610	25
Curlew	Red	✓	✓	✓	97	35240	350

[9] Colhoun K. & Cummins, S. 2013 Birds of Conservation Concern in Ireland 2014-19. Irish Birds 9:523-544

Ballyvergan Marsh hosts a regular wintering roost of Annex 1 listed Hen Harrier. The peak counts of 3 - 5 adults recorded (up to 3 pairs) is potentially at least 1% of the National breeding population (108 – 157 national breeding pairs in Ireland[10]). These individuals are likely SCI associated with SPA sites for breeding Hen Harrier in particular individuals associated with a number of breeding harrier SPA in the south west of Ireland. Mullaghanish to Musheramore Mountains SPA is the closest and is discussed in Table 2.3. The closest roosting point in November was approximately 1325 metres west of the proposed cable route. In January, the closest roosting point was 725 metres west; the closest roosting point in February was 1120 metres west, and the closest roosting point in March was 870 metres southwest of the proposed pipeline.

3.2.4 European Sites

3.2.4.1 Great Island Channel SAC

Great Island Channel SAC is located approximately 1.7km from the closest extent of the Proposed Development. The site synopsis for the SAC (NPWS, 2013) notes that "*The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.*"

The Natura 2000 Standard Data Form (NPWS 2019) for the Great Island Channel SAC identifies the following most important impacts and activities with high negative effect on the site:

- Fertilisation
- Marine and freshwater aquaculture
- Reclamation of land from sea, estuary or marsh
- Roads, motorways
- Urbanised areas, human habitation
- Invasive non-native species
- Grazing
- Eutrophication (natural)

As previously noted, invasive non-native species have been recorded during the field surveys for the Project and may be impacted by the construction phase. None of the other impacts and activities as outlined above are linked to the Project.

The QIs for which the SAC is designated, the conservation objectives identified for the QIs, and their current national conservation status and trend are outlined in Table 3.8.

[10] Ruddock, M., Mee, A., Lusby, J., Nagle, A., O'Neill, S. & O'Toole, L. (2016). The 2015 National Survey of Breeding Hen Harrier in Ireland. Irish Wildlife Manuals, No. 93. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland.

Table 3.8: Qualifying Interests for Great Island Channel SAC

Qualifying Interest (* indicates priority habitat)	Conservation Objective (NPWS 2014)	National Conservation Status and Trend (NPWS 2019)
Mudflats and sandflats not covered by seawater at low tide [1140]	To **maintain** the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Great Island Channel SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	To **restore** the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in Great Island Channel SAC,	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**

In summary, Table 3.8 indicates that

- Only one of the SAC's QIs is in favourable condition within the SAC itself [1140]; and,
- Both of the SAC's QIs are in unfavourable condition nationally.

The known extent of the tidal mudflats and Atlantic salt meadows associated with the site have been mapped in the Site-Specific Conservation objectives (NPWS 2014). The closest known extent of tidal mudflat within Great Island Channel SAC occurs approximately 2.7km to the south of the Converter station site, while the closest known extent of Atlantic salt meadows is mapped as occurring approximately 3km to the south.

As previously outlined, the Proposed Development requires crossings of watercourses with downstream hydrological connectivity to this European site.

3.2.4.2 Ballymacoda (Clonpriest and Pillmore) SAC

Ballymacoda (Clonpriest and Pillmore) SAC is located approximately 2.1 km from the closest extent of the Proposed Development at the landfall site. The Proposed Development requires crossings of nine watercourses with downstream hydrological connectivity to the European site. The site synopsis for the SAC (NPWS 2015) notes that the European site "*… stretches north-east from Ballymacoda to within about 6 km of Youghal, Co. Cork.*"

The Natura 2000 Standard Data Form for Ballymacoda (Clonpriest and Pillmore) SAC (NPWS 2019) identifies the following most important impacts and activities with high negative effect on the site:

- Fertilisation
- Eutrophication (natural)
- Hunting
- Bait digging / collection
- Pole fishing
- Invasive non-native species
- Grazing
- Taking and removal of animals (terrestrial)
- Dispersed habitation
- Walking, horse-riding and non-motorised vehicles
- Sports pitch

As previously noted, invasive non-native species have been recorded during the field surveys for the Project and may be impacted by the construction phase. None of the other impacts and activities as outlined above are linked to the Project.

The QIs for which the SAC is designated, the conservation objectives identified for the habitats, and their current national conservation status is outlined in Table 3.9.

Table 3.9: Qualifying Interests for Ballymacoda (Clonpriest and Pillmore) SAC

Qualifying Interest (* indicates priority habitat)	Conservation Objective (NPWS 2015)	National Conservation Status and Trend (NPWS 2019)
Estuaries [1130]	To maintain the favourable conservation condition of Estuaries in Ballymacoda (Clonpriest and Pillmore) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Mudflats and sandflats not covered by seawater at low tide [1140]	To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Ballymacoda (Clonpriest and Pillmore) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Salicornia and other annuals colonising mud and sand [1310]	To restore the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in Ballymacoda (Clonpriest and Pillmore) SAC	The overall conservation status for the habitat is **favourable** and the conservation status trend is **stable**
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	To maintain the favourable conservation condition of Atlantic salt meadows *Glauco-Puccinellietalia maritimae*) in Ballymacoda (Clonpriest and Pillmore) SAC.	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**

In summary, Table 3.9 indicates that

- Only one of the SAC's Qis [1310] is in favourable condition within the SAC itself.
- The same QI is the only one which is in favourable condition nationally.

The extent of the estuaries, tidal mudflats, *Salicornia* mud, and Atlantic salt meadows associated with the site have been mapped in the Site-Specific Conservation objectives (NPWS 2015). In all cases the closest points of the development are associated with the cable route. The estuaries, tidal mudflat and Atlantic salt meadows are associated with the most northerly point of the SAC, and so occur approximately 2.1km to the south of the cable route at their closest extent. Salicornia mud is mapped slightly further south within the SAC boundary, occurring approximately 2.7km to the south of the cable route.

As previously described, the lands within the footprint of the Proposed Development do not constitute the QIs for which the site is designated. There is, therefore, no potential for the QIs associated with Ballymacoda (Clonpriest and Pillmore) SAC to occur within the red line boundary.

As previously outlined, the Proposed Development requires crossings of watercourses with downstream hydrological connectivity to this European site.

3.2.4.3 Blackwater River (Cork/Waterford) SAC

Blackwater River (Cork/Waterford) SAC is located approximately 1.4km from the closest extent of the Proposed Development. Hydrological connectivity is present through the coastal waters of

Youghal Bay, and the Lower Blackwater Estuary. The site synopsis for the SAC (NPWS 2016) notes that the "*The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains."*

The Natura 2000 Standard Data Form for Blackwater River (Cork/Waterford) SAC (NPWS 2018) identifies the following most important impacts and activities with high negative effect on the site:

- Sylviculture, forestry
- Landfill, land reclamation and drying out, general
- Railway lines, TGV
- Disposal of household / recreational facility waste
- Invasive non-native species
- Grazing
- Nautical sports
- Erosion
- roads, motorways
- Industrial or commercial areas
- Sand and gravel extraction
- Urbanised areas, human habitation
- Fertilisation
- Sport and leisure structures
- Mowing / cutting of grassland
- Leisure fishing

As previously noted, invasive non-native species have been recorded during the field surveys for the Project and may be impacted by the construction phase. The works will require construction of internal roads at the proposed Converter Station site. These are located entirely outside of the SAC. The impact of these internal roads will be assessed as part of the overall development at the proposed Converter Station site. None of the other impacts and activities as outlined above are linked to the Project.

The QIs for which the SAC is designated, the conservation objectives identified for the various habitats and species, and their current conservation status trends are outlined in Table 3.10.

Table 3.10: Qualifying Interests for Blackwater River (Cork/Waterford) SAC

Qualifying Interest (* indicates priority habitat)	Conservation Objective (NPWS 2012)	Conservation Status Trend (NPWS 2019)
Estuaries [1130]	To **maintain** the favourable conservation condition of Estuaries in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Mudflats and sandflats not covered by seawater at low tide [1140]	To **maintain** the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Perennial vegetation of stony banks [1220]	To **maintain** the favourable conservation condition of Perennial vegetation of stony banks in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **stable**
Salicornia and other annuals colonising mud and sand [1310]	To **maintain** the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **favourable** and the conservation status trend is **stable**
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	To **restore** the favourable conservation condition of Atlantic salt meadows (Glauco - Puccinellietalia maritimae) in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	To **maintain** the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi) in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]	To **maintain** the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho - Batrachion* vegetation in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	To **restore** the favourable conservation condition of Old sessile oak woods with Ilex and Blechnum in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **bad** and the conservation status trend is **deteriorating**
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]	To **restore** the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior (*Alno - Padion, Alnion incanae, Salicion albae*) in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the habitat is **bad** and the Conservation Status trend is **deteriorating**
Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]	To **restore** the favourable conservation condition of the Freshwater Pearl Mussel in the	The overall conservation status for the species is **bad** and the

Qualifying Interest (* indicates priority habitat)	Conservation Objective (NPWS 2012)	Conservation Status Trend (NPWS 2019)
	Blackwater River (Cork/Waterford) SAC	conservation status trend is **deteriorating**
Austropotamobius pallipes (White-clawed Crayfish) [1092]	To **maintain** the favourable conservation condition of White - clawed Crayfish in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **Bad** and the conservation status trend is **deteriorating**.
Petromyzon marinus (Sea Lamprey) [1095]	To **restore** the favourable conservation condition of Sea Lamprey in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **Bad** and the conservation status trend is **deteriorating**.
Lampetra planeri (Brook Lamprey) [1096]	To **maintain** the favourable conservation condition of Brook Lamprey in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **favourable** and the conservation status trend is **stable**.
Lampetra fluviatilis (River Lamprey) [1099]	To **maintain** the favourable conservation condition of River Lamprey in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **unknown** and the conservation status trend is **not available.**
Alosa fallax fallax (Twaite Shad) [1103]	To **restore** the favourable conservation condition of Twaite Shad in the Blackwater River (Cork/Waterford) SAC,	The overall conservation status for the species is **bad** and the conservation status trend is **stable**.
Salmo salar (Salmon) [1106] (only in fresh water)	To **maintain** the favourable conservation condition of Atlantic Salmon in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **inadequate** and the conservation status trend is **stable**
Lutra lutra (Otter) [1355]	To **restore** the favourable conservation condition of Otter in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **favourable** and the conservation status trend is **improving**
Trichomanes speciosum (Killarney Fern) [1421]	To **maintain** the favourable conservation condition of Killarney Fern in the Blackwater River (Cork/Waterford) SAC	The overall conservation status for the species is **favourable** and the conservation status trend is **stable**
Taxus baccata woods	The conservation objectives note that "*The status of Taxus baccata woods of the British Isles as a qualifying Annex I habitat for the Blackwater River (Cork/Waterford) SAC is currently under review. The outcome of this review will determine whether a site - specific conservation objective is set for this habitat*"	

In summary, Table 3.10 indicates that:

- For seven of QIs the conservation status is listed as inadequate, and for the majority of the QIs the conservation trend is deteriorating
- Six QIs have conservation status that is bad and only three are listed as favourable.

The known extents of a number of the habitats associated with the European site boundary have been mapped in the Site-Specific Conservation objectives or referenced in the site synopsis. It is of note that some habitats and species may extend beyond and occur outside the European site boundary. The closest extents of these QIs inside of the SAC as mapped in the conservation objectives (NPWS 2012) are outlined in Table 3.11 hereunder:

Table 3.11: Qualifying Interests Location in Relation to the Project

Qualifying Interest	Known Location in Relation to the Project
Estuaries	Estuaries are mapped at their closest point 1.4km from the project.
Mudflats and sandflats not covered by seawater at low tide	Mudflats and sandflats not covered by seawater at low tide are mapped at their closest point at 1.4km from the Proposed Development
Perennial vegetation of stony banks [1220]	Perennial vegetation of stony banks has not been mapped for this European site. The site synopsis notes that the shingle spit at Ferrypoint supports a good example of this habitat. Ferrypoint is located approximately 2.5km from the Proposed Development.
Salicornia and other annuals colonising mud and sand	Salicornia and other annuals colonising mud and sand has not been mapped for this European site. The site synopsis notes that areas of Salicornia mud are found on the eastern side of the townland of Foxbole above Youghal, at Blackbog, and along the Tourig and Kinsalebeg estuaries. The closest of these is located approximately 2.5km from the Proposed Development.
Atlantic salt meadows	Atlantic salt meadows are mapped at their closest extent approximately 3.5km from the Proposed Development.
Mediterranean salt meadows	Mediterranean salt meadows are mapped at their closest extent approximately 4.4km from the Proposed Development
Floating river vegetation	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation have not been mapped within the site. The site synopsis notes that floating river vegetation is found along much of the freshwater stretches within the site. The freshwater watercourse to the works that has connectivity to the European site is located approximately 2.5km north of the Proposed Development.
Old sessile oak woods	Old sessile oak woods have been mapped at their closest extent approximately 4.7km from the Proposed Development.
Alluvial forests	Alluvial woodlands have been mapped at their closest extent approximately 20km from the Proposed Development.
Freshwater Pearl Mussel)	Catchments associated with freshwater pearl mussel, along with areas identified as suitable habitat and their target distribution have been mapped. The closest such freshwater catchment is mapped at 6.5km from the Proposed Development.
White-clawed Crayfish	Freshwater crayfish within the Blackwater (Cork/Waterford) SAC are identified as being largely within the Awbeg river. The Awbeg river is located approximately 38km from the project. In recent years crayfish have been recorded on other tributaries of the Blackwater. The freshwater extents of the Blackwater (Cork/Waterford) SAC are located in an entirely separate catchment to the Project.
Sea Lamprey	Sea lamprey records within the SAC relate to spawning habitat for the species. The closest extent of such is located approximately 18km from the works. Further, the freshwater extents of the Blackwater (Cork/Waterford) SAC are located in an entirely separate catchment to the Project. Lamprey habitat was recorded along a number of watercourses during aquatic surveys carried out. The closest of these rivers to the Blackwater river is located 13km away (hydrological route).
Brook Lamprey River Lamprey	River and brook lamprey are associated with the freshwater extents of the SAC. The closest freshwater watercourse with connectivity to the European site is located approximately 2.5km from the Proposed Development. The freshwater extents of the Blackwater (Cork/Waterford) SAC are located in an entirely separate catchment to the Project with no downstream connectivity. Lamprey habitat was recorded along a number of watercourses during aquatic surveys carried out. The closest of these rivers to the Blackwater river is located 13km away (hydrological route).
Twaite Shad	The extent of twaite shad has not been mapped in the conservation objectives mapping. Records have, however, been provided in the rare and protected species mapping from the NPWS. The closest record to the project is located approximately 2.3km from the project.

Qualifying Interest	Known Location in Relation to the Project
Atlantic salmon (freshwater)	The conservation objectives for the Blackwater River (Cork/Waterford) SAC specify that Atlantic salmon are designated only in terms of their freshwater extent (although associated attributes account for migratory routes) . The closest freshwater watercourse with connectivity to the European site is located approximately 2.5km from the Proposed Development. The freshwater extents of the Blackwater (Cork/Waterford) SAC are located in an entirely separate catchment to the Project with no downstream hydrological connectivity to the project.
Otter	The conservation objectives for the Blackwater River (Cork/Waterford) SAC map otter habitat at its closest extent at the edge of the European site boundary 1.4km from the project. Otter signs were recorded along a number of watercourses during aquatic surveys. The closest of these rivers to the Blackwater river SAC is located 13km away (hydrological route).
Killarney fern	Killarney fern is recorded in two locations within the SAC. The closest of these is located approximately 7.2km from the project at it's closest point.

As described previously there is no potential for habitats associated with the SAC to occur within the footprint of the Proposed Development. While there is connectivity within the coastal waters, the habitats for which the SAC is designated are located north of the mouth of the estuary within the Blackwater River system. There is potential, however, for a number of QIs associated with the SAC to occur outside of the European Site boundary in proximity to the Proposed Development. These are as follows:

- Twaite shad may be present within the coastal waters adjacent to the works area. There is potential, therefore, for twaite shad to be present in close proximity to the works areas. No rivers within the works footprint are known to be used by twaite shad and the main populations are in the River Blackwater which is not hydrologically linked to the development. The works described herein are not likely to affect Twaite Shad.
- Sea lamprey may be present within the coastal waters adjacent to the works areas. There is potential therefore for sea lamprey to be present in close proximity to the works. No rivers within the works footprint are known to be used by sea lamprey and the main spawning populations are in the River Blackwater which is not hydrologically linked to the development. The works described herein are not likely to affect sea lamprey.
- Suitable brook and/ or river lamprey habitat was recorded on a number of watercourses along the proposed cable route. The closest of these rivers to the SAC is located approximately 13km away (Hydrological route), in a separate catchment with no direct hydrological linkage. Given the nature of the lifecycles of these species, entirely within individual river catchments, there is not likely to be significant linkage between populations encountered and the Blackwater Estuary SAC populations. However, pollution control measures are appropriate for protection of water quality for this and other aquatic species.
- Atlantic salmon potentially spawn in some of the watercourses along the proposed route. The closest of these rivers to the SAC is located approximately 13km away (hydrological route), in a separate river catchment with no direct hydrological linkage. Given the nature of the lifecycles of atlantic salmon during freshwater aquatic phase of lifecycle typically within individual river catchments, there is not likely to be significant linkage between populations encountered and the Blackwater Estuary SAC populations. However, pollution control measures are appropriate for protection of water quality for this and other aquatic species.
- Otter signs were recorded along a number of watercourses during aquatic surveys. The closest of these rivers is located 13km from the SAC. No otter signs, holts or couches were recorded within 150m of the works areas at the landfall, or at Ballyvergan Marsh. Otter may, however, utilise these areas commuting and foraging at least on occasion. Otter were also

recorded use river crossings along the proposed cable route. Otter female home ranges have been shown to average 7.5 ± 1.5 km (O'Neill *et.,* 2009). It is possible that individuals (males) may move between the Blackwater River catchment and the study area.

3.2.4.4 Cork Harbour SPA

Cork harbour SPA is located approximately 2.5km from the closest extent of the Proposed Development. The Proposed Development requires six watercourse crossings with downstream hydrological connectivity to the European site. The site synopsis for the SPA (NPWS, 2015) notes that "*Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra.*"

The Natura 2000 Standard Data Form (NPWS 2018) for Cork Harbour SPA identifies the following most important impacts and activities with high negative effect on the site[11]:

- Pole fishing
- Industrial or commercial areas
- Nautical sports
- Shipping lanes
- Walking, horseriding and non-motorised vehicles
- Roads, motorways
- Urbanised areas, human habitation
- Dispersed habitation
- Marine and Freshwater Aquaculture
- Fertilisation

The Project is located entirely outside of the boundary of the SPA. As previously noted, the works will require construction of internal roads at the proposed Converter Station site. These are located entirely outside of the SPA. The impact of these internal roads will be assessed as part of the overall development at the proposed Converter Station site. None of the other impacts and activities as outlined above are linked to the Project.

The SCIs for which the SPA is designated, the conservation objectives identified for them, and their current conservation status trends are outlined in Table 3.12.

Table 3.12: Special Conservation Interests for Cork Harbour SPA

Special Conservation Interests	Conservation Objective (NPWS 2014)	Population Trends (NPWS 2012)
Little Grebe (*Tachybaptus ruficollis*) [A004] [A690]	To maintain the favourable conservation condition of Little Grebe in Cork Harbour SPA,	The overall population long-term trend for the species is listed as **unknown**.
Great Crested Grebe (*Podiceps cristatus*) [A005]	To maintain the favourable conservation condition of Great Crested Grebe in Cork Harbour SPA	The overall long-term population trend for the species is listed as **unknown**.
Cormorant (*Phalacrocorax carbo*) [A017]	To maintain the favourable conservation condition of Cormorant in Cork Harbour SPA	The overall long-term population trend for the species is listed as **increasing.**

[11] Skiing, off-piste was also listed among the impacts and activities, however given that this is not an activity carried out in Cork it is removed.

Special Conservation Interests	Conservation Objective (NPWS 2014)	Population Trends (NPWS 2012)
Grey Heron (*Ardea cinerea*) [A028]	To maintain the favourable conservation condition of Grey Heron in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **stable.**
Shelduck (*Tadorna tadorna*) [A048]	To maintain the favourable conservation condition of Shelduck in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **unknown**.
Wigeon (*Anas penelope*) [A050]	To maintain the favourable conservation condition of Wigeon in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **decreasing**.
Teal (*Anas crecca*) [A052]	To maintain the favourable conservation condition of Teal in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **unknown**.
Pintail (*Anas acuta*) [A054]	To maintain the favourable conservation condition of Pintail in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **unknown.**
Shoveler (*Anas clypeata*) [A056]	To maintain the favourable conservation condition of Shoveler in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **unknown**.
Red-breasted Merganser (*Mergus serrator*) [A069]	To maintain the favourable conservation condition of Red-breasted Merganser in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **stable**.
Oystercatcher (*Haematopus ostralegus*) [A130]	To maintain the favourable conservation condition of Oystercatcher in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **unknown**
Golden Plover (*Pluvialis apricaria*) [A140]	To maintain the favourable conservation condition of Golden Plover in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **unknown**
Grey Plover (*Pluvialis squatarola*) [A141]	To maintain the favourable conservation condition of Grey Plover in Cork Harbour SPA	The overall long-term population trend for the species is listed as **unknown**
Lapwing (*Vanellus vanellus*) [A142]	To maintain the favourable conservation condition of Lapwing in Cork Harbour SPA,	The overall long-term population trend for the species is listed as **decreasing**
Dunlin (*Calidris alpina*) [A149]	To maintain the favourable conservation condition of Dunlin in Cork Harbour SPA	The overall long-term population trend for the species is listed as **decreasing**
Black-tailed Godwit (*Limosa limosa*) [A156]	To maintain the favourable conservation condition of Black-tailed Godwit in Cork Harbour SPA	The overall long-term population trend for the species is listed as **increasing**
Bar-tailed Godwit (*Limosa lapponica*) [A157]	To maintain the favourable conservation condition of Bar-tailed Godwit in Cork Harbour SPA	The overall long-term population trend for the species is listed as **decreasing**
Curlew (*Numenius arquata*) [A160]	To maintain the favourable conservation condition of Curlew in Cork Harbour SPA	The overall long-term population trend for the species is listed as **decreasing**
Redshank (*Tringa totanus*) [A162]	To maintain the favourable conservation condition of Redshank in Cork Harbour SPA	The overall long-term population trend for the species is listed as **decreasing**

Special Conservation Interests	Conservation Objective (NPWS 2014)	Population Trends (NPWS 2012)
Greenshank (*Tringa nebularia*) [A164]	To maintain the favourable conservation condition of Greenshank in Cork Harbour SPA	The overall long-term population trend for the species is listed as **increasing**
Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	To maintain the favourable conservation condition of Black-headed Gull in Cork Harbour SPA	The overall long-term population trend for the species is listed as **unknown**
Common Gull (*Larus canus*) [A182]	To maintain the favourable conservation condition of Common Gull in Cork Harbour SPA	The overall long-term population trend for the species is listed as **unknown**
Lesser Black-backed Gull (*Larus fuscus*) [A183]	To maintain the favourable conservation condition of Lesser Black-backed Gull in Cork Harbour SPA	The overall long-term population trend for the species is listed as **unknown**
Common Tern (*Sterna hirundo*) [A193]	To maintain the favourable conservation condition of Common Tern in Cork Harbour SPA	The overall long-term population trend for the species is listed as **increasing**
Wetlands	To maintain the favourable conservation condition of the wetland habitat in Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.	Not applicable

In summary, Table 3.12 shows that:

- Only three SCIs associated with the SPA are identified as having long term trends that are increasing ; and,
- Eighteen SCIs show either unknown or decreasing long term trends.

Site specific conservation objective mapping for the site (NPWS 2014) has identified a number of roosting areas for birds associated with the SPA. The closest of these sites to the Proposed Development is located approximately 2.5km to the south of the cable route. The NPWS data for this roost (albeit recorded during a single winter in 2010) is associated with redshank, teal and shelduck.

It is important to note that bird species associated with the SPA may utilise areas outside of the designated boundary for roosting or foraging. The site Conservation Objectives Supporting Document (NPWS 2014) notes that "*several of the listed waterbird species may at times use habitats situated within the immediate hinterland of the SPA or in areas outside of the SPA but ecologically connected to it*."

The closest extent of the works to the SPA occurs at the Converter station site. The wintering bird survey carried out between November and March 2019 identified the following bird species within the wider Ballyadam/IDA site in which the proposed Converter Station site is located that are SCIs of Cork harbour SPA.

- Teal – peak count of ten individuals
- Grey Heron – peak count of one individual
- Black-headed gull – peak count of two individuals
- Lesser black backed gull- peak count of six individuals

Lough Addery and Ballybutler pNHA have known populations of teal, wigeon and lapwing. Given the proximity of the cable route to the waterbodies associated with the pNHA there is potential for these species to occur within the ZoI.

Wintering bird surveys also recorded the following during surveys at Claycastle landfall site and Ballyvergan Marsh areas:

- Bar tailed godwit – Peak count 152 individuals
- Black headed gull – Peak count 38 individuals
- Common gull – peak count 88 individuals
- Cormorant – Peak count 4 individual
- Curlew – Peak count 112 individuals
- Dunlin – Peak count 1 individual
- Grey heron – Peak count 1 individual
- Grey plover – peak count 4 individuals
- Teal - peak count 24 individuals
- Turnstone - peak count 26 individuals
- Dunlin – peak count 1 individual recorded at Claycastle beach
- Lesser black-backed gull - peak count 34 individuals

As outlined previously, the potential for hydrological connectivity to the SPA has been identified through water crossings, and underground conduits within the Converter station site.

3.2.4.5 Ballymacoda Bay SPA

Ballymacoda Bay SPA is located approximately 1.5km from the closest extent of the Proposed Development. The Proposed Development requires watercourse crossings with downstream hydrological connectivity to the European site. The site synopsis for the SPA (NPWS, 2014) notes that "*This coastal site stretches north-east from Ballymacoda to within several kilometres of Youghal, Co. Cork."*

The Natura 2000 Standard Data Form (NPWS 2018) for Ballymacoda Bay SPA identifies the following most important impacts and activities with high negative effect on the site:

- Leisure fishing
- Industrial or commercial areas
- Nautical sports
- Shipping lanes
- Walking, horse-riding and non-motorised vehicles
- Roads, motorways
- Urbanised areas, human habitation
- Dispersed habitation
- Marine and Freshwater Aquaculture
- Fertilisation
- Port areas

The Project is located entirely outside of the boundary of the SPA. As previously noted, the works will require construction of internal roads at the proposed Converter Station site. These are located entirely outside of the SPA. The impact of these internal roads will be assessed as

part of the overall development at the proposed Converter Station site. None of the other impacts and activities as outlined above are linked to the Project.

The SCIs for which the SPA is designated, the conservation objectives identified for them, and their current population trends are outlined in Table 3.13

Table 3.13: Special Conservation Interests for Bayllymacoda Bay SPA

Special Conservation Interests	Conservation Objective (NPWS 2015)	Population Trends (NPWS 2012)
Wigeon (*Anas penelope*) [A050]	To maintain the favourable conservation condition of Wigeon in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **decreasing**
Teal (*Anas crecca*) [A052]	To maintain the favourable conservation condition of Teal in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Ringed Plover (*Charadrius hiaticula*) [A137]	To maintain the favourable conservation condition of Ringed Plover in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Golden Plover (*Pluvialis apricaria*) [A140]	To maintain the favourable conservation condition of Golden Plover in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Grey Plover (*Pluvialis squatarola*) [A141]	To maintain the favourable conservation condition of Grey Plover in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Lapwing (*Vanellus vanellus*) [A142]	To maintain the favourable conservation condition of Lapwing in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **decreasing**
Sanderling (*Calidris alba*) [A144]	To maintain the favourable conservation condition of Sanderling in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **increasing**
Dunlin (*Calidris alpina*) [A149]	To maintain the favourable conservation condition of Dunlin in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **decreasing**
Black-tailed Godwit (*Limosa limosa*) [A156]	To maintain the favourable conservation condition of Black-tailed Godwit in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **increasing**
Bar-tailed Godwit (*Limosa lapponica*) [A157]	To maintain the favourable conservation condition of Bar-tailed Godwit in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **decreasing**
Curlew (*Numenius arquata*) [A160]	To maintain the favourable conservation condition of Curlew in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **decreasing**
Redshank (*Tringa totanus*) [A162]	To maintain the favourable conservation condition of Redshank in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **decreasing**
Turnstone (*Arenaria interpres*) [A169]	To maintain the favourable conservation condition of Turnstone in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**

Special Conservation Interests	Conservation Objective (NPWS 2015)	Population Trends (NPWS 2012)
Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	To maintain the favourable conservation condition of Black-headed Gull in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Common Gull (*Larus canus*) [A182]	To maintain the favourable conservation condition of Common Gull in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Lesser Black-backed Gull (*Larus fuscus*) [A183]	To maintain the favourable conservation condition of Lesser Black-backed Gull in Ballymacoda Bay SPA.	The overall long-term population trend for the species is listed as **unknown**
Wetland and Waterbirds [A999]	To maintain the favourable conservation condition of the wetland habitat in Ballymacoda Bay SPA as a resource for the regularly occurring migratory birds that utilise it.	Not applicable

In summary Table 3.13 notes that with the exception of two SCIs the long term conservation trends are all either unknown or decreasing.

Site specific conservation objective mapping for the site has identified a number of roosting areas for birds associated with the SPA. The closest of these sites to the Proposed Development, which contains records of SCIs associated with Ballymacoda Bay SPA is located approximately 3.6km from the development.

It is important to note that bird species associated with the SPA may utilise areas outside of the designated boundary for roosting or foraging. The site Conservation Objectives Supporting Document notes that "*several of the listed waterbird species may at times use habitats situated within the immediate hinterland of the SPA or in areas outside of the SPA but ecologically connected to it*."

The closest extent of the works to the SPA occurs at the eastern extent of the cable route at Claycastle. The wintering bird surveys carried out between 2019 and 2021 (as outlined in section) identified the following bird species in proximity to the Proposed Development that are SCIs of Ballymacoda Bay SPA:

- Bar tailed godwit – Peak count 152 individuals
- Ringed plover – peak count 40 individuals
- Grey Plover – peak count 4 individuals
- Sanderling- peak count 159 individuals
- Redshank – peak count 2 individuals
- Teal - peak count 24 individuals
- Turnstone - peak count 26 individuals
- Dunlin – peak count 1 individual recorded at Claycastle beach
- Black-headed gull – peak 143 individuals
- Common gull – peak count 153 individuals
- Lesser black-backed gull - peak count 34 individuals
- Curlew – peak count 112 individuals

Lough Addery and Ballybutler pNHA have known populations of teal, wigeon and lapwing. Given the proximity of the cable route to the waterbodies associated with the pNHA there is potential for these species to occur within the ZoI.

As previously outlined, the Proposed Development requires crossings of watercourses with downstream hydrological connectivity to this European site.

3.2.4.6 Blackwater Estuary SPA

Blackwater Estuary SPA is located approximately 2.5km from the closest extent of the Proposed Development. Hydrological connectivity is present through the coastal waters of Youghal Bay, and the Lower Blackwater Estuary. The site synopsis for the SPA (NPWS, 2014) notes that "*The Blackwater Estuary SPA is a moderately-sized, sheltered south-facing estuary, which extends from Youghal New Bridge to the Ferry Point peninsula, close to where the river enters the sea.*"

The Natura 2000 Standard Data Form (NPWS 2018) for Blackwater Estuary SPA identifies the following most important impacts and activities with high negative effect on the site:

- Hunting
- Fertilisation
- Roads, motorways
- Leisure fishing
- nautical sports
- Urbanised areas, human habitation
- Grazing

The Project is located entirely outside of the boundary of the SPA as such, none of the impacts and activities as outlined above are linked to the Project.

The SCIs for which the SPA is designated, the conservation objectives identified for them, and their current population trends are outlined in Table 3.14.

Table 3.14: Special Conservation Interests for the Blackwater Estuary SPA

Special Conservation Interests	Conservation Objective (NPWS 2012)	Population Trends (NPWS 2012)
Wigeon (*Anas penelope*) [A050]	To maintain the favourable conservation condition of Wigeon in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **decreasing.**
Golden Plover (*Pluvialis apricaria*) [A140]	To maintain the favourable conservation condition of Golden Plover in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **unknowm**.
Lapwing (*Vanellus vanellus*) [A142]	To maintain the favourable conservation condition of Lapwing in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **decreasing**.
Dunlin (*Calidris alpina*) [A149]	To maintain the favourable conservation condition of Dunlin in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **decreasing.**
Black-tailed Godwit (*Limosa limosa*) [A156]	To maintain the favourable conservation condition of Black - tailed Godwit in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **increasing.**
Bar-tailed Godwit (*Limosa lapponica*) [A157]	To maintain the favourable conservation condition of Bar - tailed Godwit in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **decreasing.**

Special Conservation Interests	Conservation Objective (NPWS 2012)	Population Trends (NPWS 2012)
Curlew (*Numenius arquata*) [A160]	To maintain the favourable conservation condition of Curlew in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **decreasing.**
Redshank (*Tringa totanus*) [A162]	To maintain the favourable conservation condition of Redshank in Blackwater Estuary SPA	The overall long-term population trend for the species is listed as **decreasing.**
Wetland and Waterbirds [A999]	To maintain the favourable conservation condition of the wetland habitat in Blackwater Estuary SPA as a resource for the regularly occurring migratory waterbirds that utilise it	Not applicable

As indicated in Table 3.14 only two species are listed as having long term conservation trends as increasing, with the remaining SCIs either unknown or decreasing.

Site specific conservation objective mapping for the site has identified a number of roosting areas for birds associated with the SPA. The closest of these sites to the Proposed Development, which contains records of SCIs associated with Blackwater Estuary SPA is located approximately 3.6km from the development.

It is important to note that bird species associated with the SPA may utilise areas outside of the designated boundary for roosting or foraging. The site Conservation Objectives Supporting Document notes that "*several of the listed waterbird species may at times use habitats situated within the immediate hinterland of the SPA or in areas outside of the SPA but ecologically connected to it*."

The closest extent of the works to the SPA occurs at the eastern extent of the cable route at Claycastle. The wintering bird survey carried out between November and March 2019 identified the following bird species within the site that are SCIs of Blackwater Estuary SPA.

- Bar-tailed Godwit - peak count 152 individuals
- Curlew – peak count 112 individuals
- Redshank – peak count 2 individuals
- Dunlin – peak count 1 individual

Lough Addery and Ballybutler pNHA have known populations of teal, wigeon and lapwing. Given the proximity of the cable route to the waterbodies associated with the pNHA there is potential for these species to occur within the ZoI.

3.2.4.7 Mullaghanish to Musheramore Mountains SPA

Mullaghanish to Musheramore Mountains SPA is located approximately 45km from the closest extent of the Proposed Development. This is the closest Hen Harrier SPA breeding site to the proposed development and hence can be considered a potential source of wintering Hen Harrier using Ballyvergan Marsh. For the purposes of this assessment all breeding Hen Harrier SPA's are considered. The site synopsis for the Mullaghanish to Musheramore Mountains SPA (NPWS, 2012) notes that "*The Mullaghanish to Musheramore Mountains SPA comprises a substantial part of the Boggeragh/Derrynasaggart Mountains in Co. Cork. It is divided roughly into two sectors by the R582 road between Macroom and Millstreet"*

The most recent monitoring data from the Hen Harrier Project (2020) notes the following about the SPA:

"*The Hen Harrier population in the Mullaghanish to Musheramore Mountains SPA at designation was five breeding pairs. This population had undergone a serious decline until a recovery in 2020. No pairs were recorded breeding in the SPA in 2014 and between 2015 - 2019 the population fluctuated between one and two pairs. There were four successful pairs which fledged ten young in 2020 with brood sizes of four, three, two and one respectively. One pair failed at the late chick stage, most likely due to predation*."

The Natura 2000 Standard Data Form (NPWS 2018) for Mullaghanish to Musheramore Mountains SPA identifies the following most important impacts and activities with high negative effect on the site:

- Grazing
- Peat extraction
- Silviculture, forestry
- Roads, motorways
- Paths, tracks, cycling tracks
- Dispersed habitation

None of the impacts and activities as outlined above are linked to the Project.

The SPA is designated solely for hen harrier (*Circus cyaneus*) [A082]. Generic conservation objectives are available for the site (NPWS 2020) which state the objective as "*To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA*". The national long-term population trends for wintering hen harrier are listed as unknown in the latest NPWS' Article 12 reporting available (for the period 2008-2012). However, the short-term trends are severe, with decreases of c. 40%.

It is of note that hen harrier have been found to migrate outside of breeding grounds to winter roosting areas between October and March (Watson 1977, Clarke & Watson 1990). Birdwatch Ireland (2020) note that the species "*spends winter in more coastal and lowland areas throughout Irela*nd".

A recent study (O'Donoghue 2021) of the ecology and conservation of the hen harrier during non-breeding season in Ireland notes renewable energy developments and associated infrastructure among the most common pressures. The study goes on to note that pressures on the species outside of the breeding season may have repercussions on over-winter survival and fitness. This may have in-combination effects in relation to the limitation of population numbers, and ultimately the decline of the species.

Wintering bird surveys (Nagle 2020) carried out between November 2019 to March 2020 recorded hen harrier regularly at Ballyvergan marsh. The survey reported a maximum of between three and five roosting Hen Harrier between November and March. The roost surveys

indicate that the hen harriers within Ballyvergan marsh prefer the western side of the marsh and may occur within 700m of the Proposed Development. While it is not clear where the birds migrate to for the breeding season, having regard to the precautionary principal, it is assumed that these are most likely to be associated with the closest SPA Mullaghanish to Musheramore Mountains SPA. All SPA breeding Hen Harrier populations are considered.

3.3 Impact Prediction

The potential for impacts on the QIs/SCIs of European sites, as outlined above, associated with the construction and operational phases of the Proposed Development are discussed hereunder.

3.3.1 Construction Phase Impact Types

The layout of the section is such that the overarching potential for impact types is outlined first initially in greater detail, with site specific impacts then outlined in sections 3.3.2 to 3.3.2.7.

3.3.1.1 Direct Impact to Qualifying Interests / Special Conservation Interests

The potential for mobile QIs/SCIs to occur outside of European site boundaries has been identified. As such, there is potential for direct impacts to these QIs/SCIs or their supporting habitats.

The potential for direct impacts to specific QIs/SCIs is discussed below in the context of each European site.

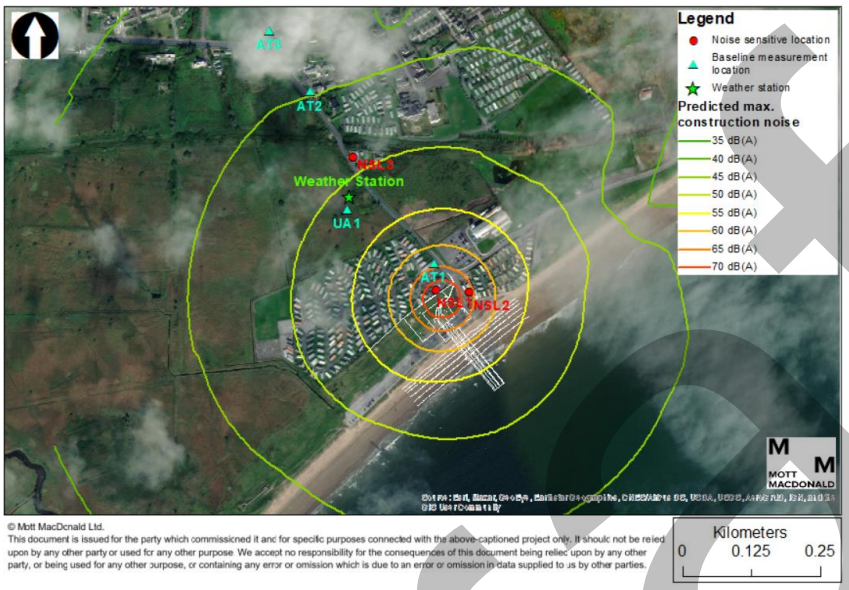
3.3.1.2 Noise and Vibration

The proposed construction works will result in increased vibration levels in proximity to the works areas in particular where piling and boring is undertaken. British Standards (2014) 'Code of construction practice for noise and vibration control on construction and open sites – Part 2: Vibration' (The Standards) provides a summary of historic case data on vibration levels measured during rotary bored piling for a range of soil conditions and pile dimensions. The Standards outline the peak particle velocity (PPV) in mm/s at a set of distances [m] and conclude that typical levels are unlikely to exceed 1mm/s at distances above 16m. The predicted level of vibration due to vibratory sheet piling falls below 1mm/s at a distance of approximately 55m

Construction phase of the works will result in elevated noise levels associated with the Proposed Development. A number of QIs/SCIs associated with European sites in the vicinity of the works have the potential, as outlined in section 3.3, to occur within the zone of impact of the works. Noise modelling for the works has been carried out. The extent of the zone of impact is variable dependant on the location where works are to be carried out, with the highest noise levels associated with more impulsive type works for example sheet piling associated with the temporary works at the Claycastle landfall. The baseline noise levels were calculated as between 55.5 $L_{Aeq,T}$ dB and 61.7 $L_{Aeq,T}$ dB. Modelling of the noise levels likely to be associated with the construction phase (Figure 3.21) of the works indicates that even at the highest levels of noise, at a distance of approximately 380m from the works, noise impacts will be back to baseline levels. As such, a zone of impact for noise associated with the construction phase of the Proposed Development is taken as 380m.

The potential for impacts to specific QIs/SCIs caused by noise and vibration is discussed below in the context of each European site.

Figure 3.21: Noise Modelling at the Landfall Location



Source: Mott MacDonald 2020

3.3.1.3 Pollution/Sedimentation Associated with Construction

The proposed works require the excavation of the cable route, at the converter station and the landfall site. Where excavations are within areas with high water tables there will be a requirement for pumping out of these excavations. There is potential, therefore, for the generation of sediment laden water associated with the construction phase of the works.

Works will require the general use of concrete. This will be at the landfall location, along the cable route, at the converter station site and at the Knockraha tie-in. There is potential for the accidental release of concrete due to these works into nearby surface water features.

The converter station will also require the use of reinforced concrete piles as part of the foundation of the structure. There is potential that in the drilling of these piles, karst features will be encountered beneath the converter station. The assumption of connectivity with European sites through potential underground conduits is being made. As such, there is potential for the release of concrete into European sites associated with these works.

The potential for impacts to specific QIs/SCIs caused by pollution and sedimentation caused by the works is discussed below in the context of each European site.

3.3.1.4 Human and Machinery presence – visual disturbance

Human and machinery presence (visual) at Ballyvergan Marsh and Claycastle Beach may cause localised temporary displacement/ disturbance during certain sensitive periods for specific SCI birds. The most sensitive periods are likely to be dusk roost times for hen harrier and during winter high tides at Claycastle beach when wader species (e.g. sanderling and bar-tailed godwit) are roosting. The potential for impacts to specific SCIs caused by visual disturbance/ displacement is discussed below in the context of each relevant European site.

3.3.1.5 Dewatering Associated with construction

There is potential for dewatering associated with construction to cause a localised draw down in groundwater. The Scottish Environmental Protection Agency (2014) specifies the zone of influence for Ground Water Dependant Terrestrial Ecosystems (GWDTE) from excavations deeper than 1m to be a 250m buffer around the works area. There are no GWDTEs associated with European sites located within at least 250m of the proposed Project.

3.3.1.6 Introduction/Spread of Invasive Species

Japanese knotweed, three cornered leek, sea buckthorn and Himalayan balsam have been recorded during site walkovers of the Proposed Development. Japanese knotweed and Himalayan balsam stands were recorded in locations where intersection with the cable route is likely. Locations of stands of invasive species are provided in Appendix B. As such, there is potential for the dispersal of invasive species caused by construction activities.

The potential for impacts to specific QIs/SCIs by the introduction or spread of invasive species caused by the works is discussed below in the context of each European site.

3.3.1.7 Dust

The proposed construction works will include extensive excavation activities, drilling, stripping of soil and the storing of spoil material. Breaking out of surfaces is required where the cable runs through existing hard standing surfaces. All activities have the potential to result in the generation of dust over the duration of the construction works. The Institute of Air Quality Management '*Guidance on the Assessment of dust from demolition and construction*' (Holman et al, 2014) prescribes potential dust emission risk classes to ecological receptors. The guidelines specify that receptor sensitivity is 'High' up to 20m from the source and reduces to 'Medium' at 50m from the source. Dust may also be generated from track-out due to heavy duty vehicle (HDV) movements from the Converter station site entrance. The proposed earthworks associated with the construction phase of the Proposed Development are considered 'Large' as per the guidelines as the Proposed Development is greater than 100,000m^2. Track out is measured from the side of the roads used by construction traffic. It is anticipated that a peak of approximately 40 HDV vehicle movements will travel to and from the Proposed Development each day. Referring to the guidelines, track-out was determined as 'Medium' which equates to dust occurring up to 50-100m from the site. The spatial limit of dust impacts is therefore determined as 100m from the access tracks.

No European sites are located within 100m of the Proposed Development site or access tracks. There is potential however for dust to deposit within the watercourses that are traversed by the Proposed Development. Further, no SCIs or QIs of European Sites with sensitivities to dust deposition (e.g. Salt Marsh) have been identified within 100m of the Proposed Development. The deposition of dust into a watercourse can increase suspended solid content of the watercourse which can result in a degradation of water quality and aquatic vegetation downstream. Considering the distance downstream however between the works area and European Sites it is likely that any dust will have naturally dissipated and will not result in any

impact to the QIs. Potential dust would form part of silt and sedimentation runoff and is discussed under section 3.5.1.3 above.

3.3.2 European Sites Identified with Viable Effect Pathways

The potential for impacts to each European site is outlined in the relevant section hereunder. Where the potential for impact is identified this is assessed against the conservation objectives in section 3.4.

3.3.2.1 Great Island Channel SAC

Direct Impacts to Habitats

The works are located outside of the European site boundary, and no habitats for which the site is designated (as outlined in section 3.3) have been recorded within or adjacent to the Proposed Development. There is no potential, therefore for direct impacts associated with the works.

Potential for Noise and Vibration Effects

There are no noise or vibration sensitive QIs associated with Great Island Channel SAC.

Pollution Associated with Construction

Hydrological connectivity has been identified to Great Island channel through four watercourses and is assumed through potential underground conduits, if present beneath the Converter station site. There is potential for the release of concrete, and sediment laden water into the SAC via these groundwater pathways.

Mudflats and sandflats are associated with communities of invertebrates within the sediment. A degradation of water quality caused by pollution of watercourses from the Proposed Development has the potential to result in damage to these communities.

Atlantic salt marsh has been found to be impacted by changes in water quality. These changes are, however, associated with changes to vegetation structure caused by enrichment (Perrin *et al.*2020) as opposed to changes to pH.

The potential for impacts to Mudflats and Sandflats associated with the Proposed Development have been identified. There is potential therefore, in the absence of mitigation, for impacts to QIs associated with Great Island Channel SAC caused by the Proposed Development during the construction phase.

Potential for Introduction/Spread of Invasive Species

Japanese knotweed has been recorded in a number of locations within the works area. While none have been recorded along watercourses with connectivity to the Great Island Channel SAC, there is potential for the presence of Japanese knotweed to occur at present or in the future in additional areas.

Small pieces of rhizome have been found to be buoyant and can be dispersed by rivers (Rouifed et al. 2011) or tides (Bailey 1994). There is potential for works at watercourse crossings with Japanese knotweed stands to result in the fragmentation of the Japanese knotweed into the river, and dispersal into the boundaries of the Great Island Channel SAC.

Himalayan balsam has been recorded upstream of Great Island Channel SAC. Himalayan balsam has been found to disperse readily through hydrochory (Love *et al.* 2013). There is potential for the works at the Owennacurra river crossings to cause the dispersal of Himalayan balsam downstream of the works areas.

Where these fragments and seeds wash downstream, there is potential for establishment of the plant species along the upper fringes of the salt marsh habitats. The formation of virtually monospecific stands is a well-known effect of invasive species that can cause a reduction in biodiversity in impacted habitats (Cronk and Fuller, 2001; van der Wal *et al*., 2008; Hejda *et al*., 2009; Love *et al.* 2013).

There is potential, therefore, in the absence of mitigation for impacts to QIs associated with Great Island Channel SAC caused by the spread of invasive species during the construction phase.

3.3.2.2 Ballymacoda (Clonpriest and Pilmore) SAC

Direct Impacts to Habitats

The works are located outside of the European site boundary, and no habitats for which the site is designated (as outlined in section 3.3) have been recorded within or adjacent to the Proposed Development. There is no potential, therefore for direct impacts associated with the works.

Potential for Noise and Vibration Effects

There are no noise or vibration sensitive QIs associated with Ballymacoda (Clonpriest and Pilmore) SAC.

Pollution Associated with Construction

Downstream hydrological connectivity has been identified to Ballymacoda (Clonpriest and Pilmore) SAC. There is potential for the release of concrete, and sediment laden water into the SAC via the watercourses identified.

Estuaries, and mudflats and sandflats are habitats closely associated with communities of invertebrates. A degradation of water quality caused by pollution of watercourses from the Proposed Development has the potential to result in damage to these communities.

Atlantic salt marsh and Salicornia mud have been found to be impacted by changes in water quality. These changes are, however, associated with changes to vegetation structures caused by enrichment (Perrin *et al.*2020) as opposed to changes pH.

The potential for impacts to estuaries and to mudflats and Sandflats associated with degradation in water quality caused by the Proposed Development have been identified. There is potential therefore, in the absence of mitigation, for impacts to QIs associated with Ballymacoda (Clonpriest and Pilmore) SAC caused by the Proposed Development during the construction phase.

Invasive Species Introduction/Spread

Japanese knotweed has been recorded upstream within the works area (Dissour_020 river crossing). Multiple stands of Japanese knotweed have been identified upstream of Ballymacoda (Clonpriest and Pilmore) SAC, refer to Appendix C. There is potential for the presence of additional stands of knotweed to occur in areas that have not yet been surveyed. Small pieces of rhizome have been found to be buoyant and can be dispersed by rivers (Rouifed et al. 2011) or tides (Bailey 1994). There is potential for works at watercourse crossings to result in the fragmentation of the Japanese knotweed into the river.

Himalayan balsam has been recorded upstream within the works area. It is likely that additional stands of the species are present along the banks of watercourses within the Proposed Development footprint. Himalayan balsam has been found to disperse readily through hydrochory (dispersal through water) (Love *et al.* 2013). There is potential for the works at river crossings to cause the dispersal of Himalayan balsam downstream of the works areas.

Where these fragments (Japanese knotweed) and/or seeds (Himalayan balsam) wash downstream, there is potential for establishment of the plant species along the upper fringes of the salt marsh habitats. The formation of virtually monospecific stands is a well-known effect of invasive species that can cause a reduction in biodiversity in impacted habitats (Cronk and Fuller, 2001; van der Wal *et al*., 2008; Hejda *et al*., 2009; Love *et al.* 2013).

There is potential, therefore, in the absence of mitigation for impacts to QIs associated with Ballymacoda (Clonpriest and Pilmore) SAC caused by the spread of invasive species during the construction phase.

3.3.2.3 Blackwater River (Cork/Waterford) SAC

Direct Impacts to Qualifying Interests

The QIs for the Blackwater River (Cork/Waterford) SAC are described in section 3.3. As outlined previously, the works are located outside of the European site boundary, and no habitats for which the site is designated have been recorded within or adjacent to the Proposed Development. There is no potential, therefore for direct impacts to habitats associated with the works.

No otter signs, holts or couches were recorded within 150m of the works areas at the landfall, or at Ballyvergan Marsh where the footprint of the development is closest to the Blackwater River SAC. Otter signs were noted at river crossings along the cable route. Given the location of the works in relation to habitats likely to be used by otter, there is potential for holts or couches to become established prior to the construction phase of the works. As such, having regard to the precautionary principal, there is potential for direct impact to otters.

No other QIs have been identified as having potential to occur directly within the footprint of the development.

Potential for Noise and Vibration Effects

While no couches or holts were identified within 150m of the works areas, there is potential for otter to commute and forage in close proximity to the works. There is potential therefore for disturbance of otter associated with Blackwater River (Cork/Waterford) SAC.

Pollution Associated with Construction

Hydrological connectivity has been identified within the transitional waters of the SAC. There is potential for the release of concrete, and sediment laden water into these waterbodies. Given the nature of the watercourses, and their location in relation to the works, there is no potential for impact to habitats for which the site is designated caused by pollution or sedimentation caused by the construction of the Proposed Development.

Otter are likely to forage and commute within the coastal waters adjacent to the landfall location. As such, there is potential for pollution caused by the works to result in damage or death to food sources on which otter rely.

Twaite Shad and lamprey associated with the SAC are likely to occur within the coastal waters near to the landfall location. These species are highly susceptible to death or damage caused by pH changes associated with spills of cement fines into water.

There is potential, therefore, for impact to QIs associated with Blackwater River SAC caused by pollution/sedimentation caused by the Proposed Development.

Invasive Species Spread

A number of invasive species have been recorded within the footprint of the Proposed Development. Given the nature of the connectivity, and the location of Blackwater River (Cork/Waterford) SAC relative to the Proposed Development there is no potential for spread of invasive species into the boundary of the SAC.

3.3.2.4 Cork Harbour SPA

Direct Impact to Special Conservation Interests and Supporting Habitat

The works are located entirely outside of the European Site boundary. However, the following SCIs associated with Cork Harbour SPA have been recorded in proximity to the Proposed Development:

- Bar tailed godwit
- Black headed gull
- Common gull
- Cormorant
- Curlew
- Dunlin
- Grey heron
- Lesser black-backed gull
- Teal
- Turnstone
- Lapwing
- Oystercatcher
- Redshank
- Wigeon

There is potential therefore, in the absence of mitigation, for indirect impacts to SCIs associated with Cork Harbour SPA caused by the Proposed Development during the construction phase as follows.

Pollution Associated with Construction

Deterioration in water quality associated with the works has, as outlined previously in relation to Great Island Channel SAC, the potential to result in a degradation of mudflat and sandflat habitats associated with the SPA. These mudflat habitats for key foraging habitat for a large number of birds associated with the SPA. There is potential therefore, in the absence of mitigation, for impacts to SCIs associated with Cork Harbour SPA caused by the Proposed Development during the construction phase.

Potential for Noise and Vibration Effects

Fourteen SCIs, as listed above, associated with Cork Harbour SPA have been recorded in proximity to the Proposed Development:

The Institute of Estuarine and Coastal Studies (2009) has reported on the differing sensitivity in terms of responses to disturbance stimuli, of different bird species. The report notes that while birds can habituate to a low level of noise (below 50dB), irregular construction noise above

70dB can have a moderate to high effect. The disturbance caused by the noise impulses has the potential to displace wintering birds away from foraging areas which are in proximity to the Proposed Development. This displacement if it is from a key foraging area in the absence of other suitable habitat has the potential to cause a loss in fitness of the species and reduce their capacity for migration at the end of the wintering season if noise impulses are ongoing throughout the winter.

The noise modelling carried out for the landfall construction works indicates that the noise levels will be above 50dB within approximately 380m of the works, taking the most impulsive noisy works at the landfall as the worst-case scenario zone of impact.

There is potential therefore, in the absence of mitigation, for impacts to SCIs associated with Cork Harbour SPA caused by noise associated with the Proposed Development during the construction phase.

Visual Disturbance SCI Birds

No direct visual disturbance will arise to SCI birds within the SPA. Claycastle Beach and Ballyvergan Marsh are the only locations with noteworthy concentrations of certain SCI species relevant this assessment i.e. that can be considered *ex situ* site[12] of SPA's. The dynamic nature of some SCI species mean significant numbers of individuals associated with this SPA may use Claycastle Beach during certain periods, including when works are ongoing and hence consideration of impacts in relation to potential for disturbance / localised displacement by presence of construction workers and machinery is outlined here. It is considered that given that roosting and foraging SCI birds have extensive alternative habitat at Claycastle and that habitats will be fully reinstated with existing materials; imperceptible impacts will arise in the absence of mitigation. Based on the precautionary principle mitigation is proposed to avoid possible temporary impacts.

Potential for Spread of Invasive Species

Japanese knotweed has been recorded in a number of locations within the works area. While none have been recorded along watercourses with connectivity to the Cork Harbour SPA, there is potential for the presence of knotweed to occur in additional areas given survey constraints.

Small pieces of rhizome have been found to be buoyant and can be dispersed by rivers (Rouifed et al. 2011) or tides (Bailey 1994). There is potential for works at watercourse crossings with Japanese knotweed stands to result in the fragmentation of the Japanese knotweed into the river, and dispersal into the boundaries of the Cork Harbour SPA.

Himalayan balsam has been recorded upstream of Cork Harbour SPA. Himalayan balsam has been found to disperse readily through hydrochory (Love *et al.* 2013). There is potential for the works at the Owennacurra river crossings to cause the dispersal of Himalayan balsam downstream of the works areas.

Where these fragments and seeds wash downstream, there is potential for establishment of the plant species along the upper fringes of the salt marsh habitats. The formation of virtually monospecific stands is a well-known effect of invasive species that can cause a reduction in biodiversity in impacted habitats (Cronk and Fuller, 2001; van der Wal *et al*., 2008; Hejda *et al*., 2009; Love *et al.* 2013).

There is potential, therefore, in the absence of mitigation for impacts to QIs associated with Cork Harbour SPA caused by the spread of invasive species during the construction phase.

[12] An ex-situ site is a habitat situated in the immediate hinterland of the SPA or ecologically connected to it, which may at times be used by some water bird species. https://www.courts.ie/acc/alfresco/91c7ad61-f9fb-4884-8677-53276fc1510f/2020_IEHC_400.docx/docx/1

3.3.2.5 Ballymacoda Bay SPA

The works are located entirely outside of the European Site boundary. However, the following SCIs associated with Ballymacoda SPA have been recorded in proximity to the Proposed Development:

- black-headed gull
- common gull
- curlew
- dunlin
- grey plover
- lapwing
- lesser black backed gull
- ringed plover
- sanderling
- teal
- turnstone
- wigeon

There is potential therefore, in the absence of mitigation, for indirect impacts to SCIs associated with Ballymacoda Bay SPA caused by the Proposed Development during the construction phase as follows.

Pollution Associated with Construction

Deterioration in water quality associated with the works has, as outlined previously in relation to Ballymacoda (Clonpriest and Pilmore) SAC, the potential to result in a degradation of estuaries, and mudflats and sandflats habitats associated with the SPA. These habitats comprise key foraging habitat for a large number of birds associated with the SPA. There is potential therefore, in the absence of mitigation, for indirect impacts to SCIs associated with Ballymacoda Bay SPA caused by the Proposed Development during the construction phase.

Potential for Noise and Vibration Effects

As outlined above, twelve SCIs associated with Ballymacoda Bay SPA have been recorded in proximity to the Proposed Development:

The Institute of Estuarine and Coastal Studies (2A009) has found that waterfowl have differing sensitivity in terms of responses to disturbance stimuli. The report notes that while birds can habituate to a low level of noise (below 50dB), irregular construction noise above 70dB can have a moderate to high effect. The disturbance caused by the noise impulses has the potential to displace wintering birds away from foraging areas which are in proximity to the Proposed Development. This displacement if it is from a key foraging area in the absence of other suitable habitat has the potential to cause a loss in fitness of the species and reduce their capacity for migration at the end of the wintering season if noise impulses are ongoing throughout the winter.

The noise modelling carried out for the landfall construction works indicates that the majority of the noise impacts associated with piling will be within the carpark and the caravan park. Noise levels will be above 50dB within approximately 380m of these works. There is potential also for

noise impulses associated with breaking out of hard standing along the existing roadway which runs along the edge of Ballyvergan Marsh. There is potential therefore, in the absence of mitigation, for disturbance impacts to SCIs associated with Ballymacoda Bay SPA caused by noise associated with the Proposed Development during the construction phase.

Visual Disturbance SCI Birds

No direct visual disturbance will arise to SCI birds when using this SPA. Claycastle Beach and Ballyvergan Marsh are the only locations with noteworthy concentrations of certain SCI species relevant this assessment i.e. can be considered *ex situ* site[13] of SPA's. The dynamic nature of some SCI species mean significant numbers of individuals associated with this SPA may use Claycastle Beach during certain periods, including when works are ongoing and hence consideration of impacts in relation to potential for disturbance / localised displacement by presence of construction workers and machinery is outlined here. It is considered that given that roosting and foraging SCI birds have extensive alternative habitat at Claycastle and that habitats will be fully reinstated with existing materials; imperceptible impacts will arise in the absence of mitigation. Based on the precautionary principle mitigation is proposed to avoid possible temporary impacts.

Invasive Species Spread

Japanese knotweed has been recorded upstream within the works area. Multiple stands of Japanese knotweed have been identified upstream of Ballymacoda Bay SPA. There is potential for the presence of additional stands of knotweed to occur in areas that have not yet been surveys. Small pieces of rhizome have been found to be buoyant and can be dispersed by rivers (Rouifed et al. 2011) or tides (Bailey 1994). There is potential for works at the watercourse crossing to result in the fragmentation of the Japanese knotweed into the river.

Himalayan balsam has been recorded upstream within the works area. It is likely that additional stands of the species are present along the banks of watercourses within the Proposed Development footprint. Himalayan balsam has been found to disperse readily through hydrochory (Love *et al.* 2013). There is potential for the works at river crossings to cause the dispersal of Himalayan balsam downstream of the works areas.

Where these fragments and seeds wash downstream, there is potential for establishment of the plant species along the upper fringes of the salt marsh habitats. The formation of virtually monospecific stands is a well-known effect of invasive species that can cause a reduction in biodiversity in impacted habitats (Cronk and Fuller, 2001; van der Wal *et al*., 2008; Hejda *et al*., 2009; Love *et al.* 2013).

Japanese knotweed has also been recorded at Balyvergan Marsh, there is therefore potential in spread of this stand caused by the works to result in a degradation of *ex situ* habitat for wintering SCIs

There is potential, therefore, in the absence of mitigation for impacts to QIs associated with Ballymacoda Bay SPA caused by the spread of invasive species during the construction phase

[13] An ex-situ site is a habitat situated in the immediate hinterland of the SPA or ecologically connected to it, which may at times be used by some water bird species. https://www.courts.ie/acc/alfresco/91c7ad61-f9fb-4884-8677-53276fc1510f/2020_IEHC_400.docx/docx/1

3.3.2.6 Blackwater Estuary SPA

The works are located entirely outside of the European Site boundary. However. the following SCIs associated with Blackwater Estuary SPA have been recorded in proximity to the Proposed Development:

- bar-tailed godwit
- curlew
- redshank
- dunlin
- teal,
- wigeon
- lapwing

There is potential therefore, in the absence of mitigation, for indirect impacts to SCIs associated with Blackwater Estuary Bay SPA caused by the Proposed Development during the construction phase as follows.

Pollution/Sedimentation Associated with Construction

As discussed for Blackwater River (Cork/Waterford) SAC hydrological connectivity to the designated sites has been identified only through transitional waters. There is potential for the release of concrete, and sediment laden water into these waterbodies. Given the nature of the watercourses, and their location in relation to the works, there is no potential for impact to habitats for which the site is designated caused by pollution or sedimentation caused by the construction of the Proposed Development.

As such, there is no potential for indirect degradation of wetland habitats within the European Site boundary.

Potential for Noise and Vibration Effects

As outlined above, seven SCIs associated with Blackwater Estuary SPA have been recorded in proximity to the Proposed Development:

The Institute of Estuarine and Coastal Studies (2A009) has found that waterfowl have differing sensitivity in terms of responses to disturbance stimuli. The report notes that while birds can habituate to a low level of noise (below 50dB), irregular construction noise above 70dB can have a moderate to high effect. The disturbance caused by the noise impulses has the potential to displace wintering birds away from foraging areas which are in proximity to the Proposed Development. This displacement if it is from a key foraging area in the absence of other suitable habitat has the potential to cause a loss in fitness of the species and reduce their capacity for migration at the end of the wintering season if noise impulses are ongoing throughout the winter.

The noise modelling carried out for the landfall construction works indicates that the majority of the noise impacts associated with piling will be within the carpark and the caravan park. Noise levels will be above 50dB within approximately 380m of these works. There is potential also for noise impulses associated with breaking out of hard standing along the existing roadway which runs along the edge of Ballyvergan Marsh. There is potential therefore, in the absence of mitigation, for disturbance impacts to SCIs associated with Blackwater Estuary SPA caused by noise associated with the Proposed Development during the construction phase.

Visual Disturbance SCI Birds

No direct visual disturbance will arise to SCI birds when using this SPA. Claycastle Beach and Ballyvergan Marsh are the only locations with noteworthy concentrations of certain SCI species relevant this assessment i.e. can be considered *ex situ* site of SPA's. The dynamic nature of some SCI species mean significant numbers of individuals associated with this SPA may use Claycastle Beach during certain periods, including when works are ongoing and hence consideration of impacts in relation to potential for disturbance / localised displacement by presence of construction workers and machinery is outlined here. It is considered that given that roosting and foraging SCI birds have extensive alternative habitat at Claycastle and that habitats will be fully reinstated with existing materials; imperceptible impacts will arise in the absence of mitigation. Based on the precautionary principle mitigation is proposed to avoid possible temporary impacts.

Invasive Species Spread

A number of invasive species have been recorded within the footprint of the Proposed Development. Given the nature of the connectivity, and the location of Blackwater Estuary SPA relative to the Proposed Development there is no potential for spread of invasive species into the boundary of the SPA.

Japanese knotweed has also been recorded at Balyvergan Marsh, there is therefore potential in spread of this stand caused by the works to result in a degradation of *ex situ* habitat for wintering SCIs

3.3.2.7 Mullaghanish to Musheramore Mountains SPA

Direct Impact to Special Conservation Interests and Supporting Habitat

The works are located entirely outside of the European Site boundary. However, wintering hen harrier have been recorded at Ballyvergan marsh in proximity to the Proposed Development. The wintering bird surveys carried out for the Ballyvergan marsh recorded the roosts at their closest point 700m from the works areas. As such, there is no potential for direct impact to wintering hen harrier and their winter roosts.

Pollution/Sedimentation Associated with Construction

As discussed previously, Mullaghanish to Musheramore Mountains SPA is located a significant distance from the Proposed Development at 45km to the north. Given the location in relation to the Proposed Development, there is no potential for impact to habitats within the SPA boundary caused by the Proposed Development.

Given the nature of the marsh at Ballyvergan, and the Project, there is no potential for degradation of roosting habitat caused by surface water emissions associated with the proposed works.

Potential for Noise and Vibration Effects

As outlined above, wintering hen harrier associated with Mullaghanish to Musheramore Mountains SPA have been recorded in proximity to the Proposed Development. Displacement of hen harrier from their winter roost has the potential to result in a loss of fitness for impacted individuals.

Little information is available in relation to disturbance responses in wintering hen harrier. In breeding hen harrier, a safe working distance buffer of between 500m and 1000m is recommended (Petty 1998, Romin & Muck 1999; Currie & Elliot 1997, Whitfield et al., 2008). As

such, having regard to the precautionary principle, the buffer for disturbance to wintering hen harrier specifically when they arrive into roost areas is taken as 1000m.

There is potential therefore, in the absence of mitigation, for noise disturbance impacts to hen harrier associated with Mullaghnish to Musheramore Mountains SPA caused by noise associated with the Proposed Development during the construction phase.

Visual Disturbance

No direct visual disturbance will arise to SCI birds when using this SPA or other SPA utilised by breeding Hen Harrrier. Roosting Hen Harrier regularly use Ballyvergan Marsh during the winter as a roost site and it is an important *ex situ* site for Hen Harrier including individuals that likely breed on SPA sites. Hen Harrier are sensitive to disturbance particularly when they return at dusk to roost. Hence consideration of impacts in relation to potential for disturbance / localised displacement by presence of construction workers and machinery is outlined here. It is noted that given that while recorded roost areas are typically > 700m from proposed works areas, precautionary mitigation is required to avoid possible temporary disturbance/ displacement impacts during construction works, specifically within Ballyvergan Marsh.

Invasive Species Spread

A number of invasive species have been recorded within the footprint of the Proposed Development. Given the nature of the connectivity, and the location of Mullaghanish to Musheramore Mountains SPA relative to the Proposed Development there is no potential for spread of invasive species into the boundary of the SPA.

Japanese knotweed has also been recorded at Balyvergan Marsh, the habitat in which the hen harrier is roosting and likely foraging. There is therefore potential in spread of this stand caused by the works to result in a degradation of *ex situ* supporting habitat for wintering SCIs.

3.3.3 Operational Phase

Maintenance for the works will be largely restricted to works at the converter station, the joint bays along the cable route, and the landfall area. If significant repair works are required than subject to nature and scale of these works there may be a requirement to screen these works for Appropriate Assessment. However, it is considered given the location of these works' areas, the nature of the works and the nature of the European sites, there is no potential for impacts caused by the operational phase of the development.

3.3.4 Summary

The Proposed Development has the potential to result in the following impacts at the construction phase of the works, as outlined below in Table 3.14

Table 3.15: Potential for Impact in the Absence of Mitigation Identified

European Site	Impact to QIs/SCIs Identified
Great Island Channel SAC	Potential for degradation of Mudflats and Sandflats caused by pollution of watercourses
	Potential for degradation of Atlantic salt marsh due to invasive species spread
Ballymacoda (Clonpriest and Pilmore) SAC	Potential for degradation of Estuaries caused by pollution of watercourses
	Potential for degradation of Mudflats and Sandflats caused by pollution of watercourses
	Potential for degradation of Atlantic salt marsh due to invasive species spread
Blackwater River (Cork/Waterford) SAC	Potential for impacts to couches and holts which may be established prior to the construction phase of the works commencing
	Potential for noise disturbance to otter
	Potential for impacts to food sources for otter caused by pollution of watercourses
	Potential for impacts to twaite shad caused by pollution of coastal waters
	Potential for impacts to sea lamprey caused by pollution of coastal waters
Cork Harbour SPA	Potential for direct impact to *ex situ* supporting habitat SCI species
	Degradation of wetland habitat within the SPA boundary caused by pollution
	Potential for noise and visual disturbance to bar tailed godwit, black headed gull, common gull, cormorant, curlew, dunlin, grey heron, lesser black-backed gull, teal, turnstone, lapwing, oystercatcher, redshank, wigeon
	Degradation of supporting habitat caused by invasive species spread
Ballymacoda Bay SPA	Potential for direct impact to *ex situ* supporting habitat SCI species
	Deterioration in supporting habitat within the European Site boundary due to water quality impacts
	Noise and visual disturbance impacts to black-headed gull, common gull, curlew, dunlin, grey plover, lapwing, lesser black backed gull, ringed plover, sanderling, teal, turnstone, wigeon
	Degradation of supporting habitat for SCIs caused by invasive species spread
Blackwater Estuary SPA	Potential for direct impact to *ex situ* supporting habitat SCI species
	Noise and visual disturbance to bar-tailed godwit, curlew, redshank, dunlin, teal, wigeon and lapwing
Mullaghanish to Musheramore Mountains SPA	Noise and visual disturbance to wintering hen harrier
	No direct impact. Degradation of supporting habitat for SCIs caused by invasive species spread

3.3.5 Plans and Projects which Might Act In-combination

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

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.

It is therefore required that the potential impacts of the Proposed Development are considered in combination with any other relevant plans or projects. A search of planning applications in the vicinity of the works was undertaken in December 2020 to examine projects with potential for in combination effects.

Celtic Interconnector Project below High Water Mark

As previously noted, this AA Screening assesses the effects on European sites of the Irish land-based elements of the Project (down to, and including the High Water Mark), in combination with other plans or projects, including Irish Project elements below the High Water Mark, Irish elements offshore, elements in the UK Exclusive Economic Zone, and French elements of the Project.

A separate AA Screening and NIS has been drafted for the (Irish) Offshore elements of the works ('the Irish offshore NIS'). The AA Screening for the Irish offshore NIS could not exclude the potential for likely significant effects on the Ballymacoda Bay SPA and the Blackwater Estuary SPA. However, the Irish offshore NIS' concluded there would be no adverse effects on the integrity of any European sites, either alone or in combination with other plans or projects.

Should works associated with the cable route up to the high water mark take place concurrently to the works at the landfall location, there is potential for an in-combination effect on Ballymacoda Bay SPA and the Blackwater Estuary SPA resulting in increased noise emissions.

A Habitats Regulations Assessment (HRA) Screening assessment was produced for the UK (offshore) elements of the Project. This concluded that the potential for significant effects on the conservation objectives on European sites designated by the UK could be excluded for the Celtic Interconnector Project alone and in-combination with other plans and projects.

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 project alone, and in combination with other plans or projects.

Refer to Volume 6C for the Overarching project-wide NIS, which summarizes the conclusions of Article 6(3) reports across jurisdictions, and concludes on the project-wide impacts to European sites.

3.3.5.1 Plans

Cork County Development Plan

The proposed Development is located within the Cork County administrative area. The document includes objectives and policies which are associated within the protection of the natural environment. These are informed in part by an Appropriate Assessment which was undertaken to ensure that any likely effects of the plans' policies were considered in order to avoid any such adverse impacts.

The Natura Impact Report outlines European Sites which were subject to review, screening conclusions and key planning requirements to protect/restore site integrity. A summary of this assessment are provided in table Table 3.16 in relation to European Sites identified as within the ZoI for the Proposed Development.

Table 3.16: Insert Table Caption - Update fields via ribbon

European Site Name	CDP Screening Conclusion	Planning Requirements Identified in the CDP to Protect/Restore Site Integrity
Great Island Channel SAC	Potential for impacts identified relating to Port activities, designation of Strategic Employment Centres, Core Strategy, upgrading of roads infrastructure within and around the Harbour, allocation of increased population around Harbour, policies relating to tourism and recreation.	• Maintain/restore a high standard of water quality in discharging rivers and transitional coastal zones within Cork Harbour; • Prevent direct loss of estuarine habitats within the SAC; • Prevent drainage of wetland habitats; • Protect estuarine habitats from risk of toxic contamination arising from industrial and port related activities common in the harbour area.
Ballymacoda (Clonpriest and Pillmore) SAC	Not identified as having potential to be impacted by the CDP. The site was screened out at the draft development plan stage	• Maintain or restore a high standard of water quality in discharging rivers and transitional coastal zones in bay area • Prevent direct loss of estuarine habitats within the SAC • Prevent drainage of wetland habitats • Prevent contamination or deterioration of estuarine habitats
Blackwater River (Cork/Waterford) SAC	Potential for significant impacts to arise relating in particular to Core Strategy, Wind Energy Strategy, and provision of roads infrastructure.	• Restore a high standard of water of water quality in surface waters in SAC; • Maintain open channels to allow the free passage of fish in freshwater habitats; • Maintain stable hydrological regime in surface waters in SAC; • Prevent direct loss of freshwater habitats within SAC; • Prevent drainage of wetland habitats; • Prevent contamination or other deterioration of freshwater habitats in SAC; • Prevent disturbance to otter and otter habitat.

European Site Name	CDP Screening Conclusion	Planning Requirements Identified in the CDP to Protect/Restore Site Integrity
Cork Harbour SPA	Potential for impacts Identified relating to Port activities, designation of Strategic Employment Centres, Core Strategy, upgrading of roads infrastructure within and around the Harbour, allocation of increased population around Harbour, policies relating to tourism and recreation.	• Prevent disturbance to wintering birds; • Maintain/restore a high standard of water quality in discharging rivers and transitional coastal zones in bay area; • Prevent direct loss of estuarine habitats within the SAC; • Prevent drainage of wetland habitats; • Prevent contamination or deterioration of estuarine habitats.
Ballymacoda Bay SPA	Not identified as having potential to be impacted by the CDP.	
Blackwater Estuary SPA	Potential impacts identified relating to inadequate treatment of wastewater and tourism policies.	
Mullaghanish to Musheramore Mountains SPA	No potential impacts specified but amendments recommended to draft plan re wind energy policy and provision of wastewater infrastructure	• Prevent disturbance to breeding birds; • Protect feeding and breeding habitat of hen harrier

Adherence to the Council's policies and objectives will ensure that all plans and projects proposed within the county are subjected to the tests of Appropriate Assessment. This will assess the potential for likely significant effects to European Sites, and where deemed necessary, the potential for an adverse effect on European Site integrity, either alone or in combination with other plans and projects.

3.3.5.2 Current Projects

Midleton to Youghal Greenway

The project comprises a Greenway route which runs from the north-eastern corner of Midleton to the old railway station at Youghal in east Cork. As part of the application an Appropriate Assessment Screening report was prepared.

This screening report for the greenway concludes that:

"*Appropriate Assessment, based on the best available scientific information, demonstrates that construction and operation of the proposed Greenway between Midleton and Youghal, Co. Cork, poses no risk of likely significant effects on Natura 2000 sites (e.g. Great Island Channels SAC, Cork Harbour SPA, Ballymacoda (Clonpriest and Pillmore) SAC or Ballymacoda Bay SPA)*."

Construction works for the greenway are currently progressing and will be complete in advance of the Celtic Interconnector Project progressing. There is potential, therefore, for an overlap with the construction phase of the Project. No potential for disturbance to wintering birds was identified in the AA screening for the greenway, as no supporting habitat was identified within or along the scheme.

The timing of the works is such that the greenway will be constructed prior to the commencement of the construction phase of this Proposed Development. No potential for in-combination impacts have been identified.

Lower Lee Flood Relief Scheme

The OPW in conjunction with Cork County Council are advancing the Lower Lee (Cork City) Flood Relief Scheme. The scheme will run from Inniscarra Dam to the City Centre. A report for the Screening of Appropriate Assessment was developed for the scheme. Among other

European sites, the report examined the potential for likely significant effects on the Cork harbour SPA, and the Great Island Channel SAC.

The report concluded that "*The evaluation undertaken has identified that there will be no potential significant impact on any Special Conservation Interests and their conservation objectives, either alone or in-combination with any other plans and projects, for European sites given their distance either downstream or upstream of the proposed works and due to the operational proposals for the scheme.*"

Given the location of the flood relief scheme in relation to the Proposed Development, more than 10km to the west, and that no potential for significant impact was identified on any European sites, no potential for in-combination impacts is identified.

3.3.5.3 Future Projects

Midleton Carrigtohill WWTP upgrades

Irish Water (IW) has a growth project to construct new wastewater infrastructure (pump stations and network) to connect Midleton and Carrigtohill WWTPs by Q4 2023. The proposed (IW) route is between Carrigrenan road and the Balyadam bridge area and will overlap the proposed Celtic Interconnector cable route.

Following the design of the proposed WWTP upgrades, the final design and the project for the upgrade of the Midleton and Carrigtohill WWTPs will be subject themselves to the provisions of the Directive, i.e. requiring screening for Appropriate Assessment (and if necessary, AA).

N25 Carrigtohill to Midleton Scheme

The Cork Roads Design Office (RDO) in liaison with Transport Infrastructure Ireland (TII) are currently planning the upgrading of the part of the existing N25 between Carrigtohill and Midleton, including that portion which adjoins the proposed converter station site. This road project will involve the expansion of the existing road corridor to dual carriageway. A number of potential options affecting the wider IDA landholding at Ballyadam are currently being considered by the RDO, including the provision of a full dumb-bell interchange at Ballyadam, with associated slip roads, on the southern portion of the overall landholding. There is potential for an overlap in construction for the period of 2025-2026. There may be the potential for surface water emissions associated with the works, which has potential to cause impacts to Cork Harbour SPA.

Following the design of the scheme and selection of the preferred option, the Carrigtohill to Midleton Scheme will be subject to the provisions of the Directive, i.e. requiring screening for Appropriate Assessment (and if necessary AA).

Midleton Flood Relief Scheme Scheme

The flood relief scheme for Midleton is currently under development. There is potential for the scheme's construction to run concurrently with the construction for the Project. There is the potential for surface water impacts associated with the flood scheme which is in proximity to Great Island Channel SAC and Cork Harbour SPA. .

Following the design of the scheme and selection of the preferred option, the Midleton Flood Relief Scheme will be subject to the provisions of the Directive, i.e. requiring screening for Appropriate Assessment.

Ballyadam 110kV Substation

The Electricity Supply Board (ESB) propose to construct a new 110kV substation to the east of the proposed converter station compound. These works may require additional site clearance within the wider IDA site, and may result in additional surface water impacts. Given that the project has not yet been defined at the time of writing, the extent of this potential is unclear.

Following the design of substation, the project will be subject to the provisions of the Directive, i.e. requiring screening for Appropriate Assessment.

IDA lands at Ballyadam

Although there were no definitive projects or plans at the time of writing this EIAR it is possible that other developments within the wider Ballyadam site will be developed and that these may have potential for in-combination effects. The IDA are also likely to develop internal access roads and utility connections for the wider Ballyadam site.

As the nature of these projects and plans are not known the associated in-combination impacts cannot be assessed. However, it is likely that the plans will require additional site clearance within the wider IDA site, and may result in additional surface water impacts.

Engagement with the IDA will continue and where there is potential for works to be carried out in parallel, appropriate mitigation measures will be implemented including the scheduling of works and regular liaison meetings between project teams to ensure that plans are co-ordinated, and impacts are minimised.

Urban Expansion Project

The urban expansion of the area to the northwest of the converter station site is planned to facilitate housing development. As well as residential development, the proposals will include cycling/pedestrian facilities, a new school campus and road upgrades.

Prior to commencement of construction and during the construction phase engagement with Cork County Council will continue and where there is potential for works to be carried out in parallel. Following the design of the development, the urban expansion project will be subject to the provisions of the Directive in its own right, i.e. requiring screening for Appropriate Assessment.

Kilbarry Knockraha

Renewal and refurbishment of the Kilbarry-Knockraha 110 kV overhead transmission line.

The majority of the works associated with this project will be carried out outside the ZoI of the Celtic Interconnector project.

Following the design of the development, the refurbishment of the project will be subject to the provisions of the Directive in its own right, i.e. requiring screening for Appropriate Assessment., and if necessary, AA.

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.

In-Combination Effects

Cork Harbour SPA and Great Island SAC

The conservation objectives supporting document for Cork harbour SPA (NPWS 2014) notes the following historic activities which have caused habitat loss and degradation in habitats associated with Cork harbour SPA and Great Islands SAC:

- Loss of habitat associated with the Dunkettle roundabout
- Reclamation of land at Marino point, Rushbrooke, brown Island, Long Point, Adhada, and Ringaskiddy
- Construction of the Slatty Bridge Sluice cutting off intertidal zone and some salt marsh habitat
- The expansion of towns and villages which has required an expanding road network with many roads being built on the edges or across intertidal mudflats (Smiddy et al. 1995) with resulting habitat loss.
- General development of nearby farmland
- Grazing in salt marsh habitats

The Proposed Development does not require any land take, reclamation or change of use of any lands within any European sites. However, the degradation of wetland habitats associated with the construction phase of the works has the potential to result in in-combination effects on Great Island SAC and Cork Harbour SPA in the absence of mitigation.

It is noted that Cork Harbour has a history of problems which are caused by water pollution and eutrophication (NPWS 2014). This is caused by enrichment of the coastal waters caused by Wastewater discharge. The Proposed Development requires welfare facilities at the converter station. However, the station would be unmanned and the welfare facilities are only likely to be used sporadically during maintenance. The discharge associated with the proposed Converter Station will be to a holding tank. This will be emptied to a WWTP with design capacity to treat the waste to licenced emission limit values.

As such, there is no potential for in-combination impacts associated with enrichment of coastal waters within Cork Harbour SPA and Great Island SAC.

Ballymacoda Bay SPA and Ballymacoda (Clonpriest and Pilmore) SAC

The conservation objectives supporting document for Ballymacoda Bay SPA (NPWS 2014) notes the following historic activities which have caused habitat loss and degradation in habitats associated with Ballymacoda Bay SPA and Ballymacoda (Clonpriest and Pilmore) SAC.

- Reclamation of land adjacent to the estuary in general is noted as causing significant alterations to saltmarsh habitat within the site (McCorry & Ryle, 2009). It is thought that these changes may have contributed to alterations in the shoreline profile of the estuary within the past 150 years as well as changes in sediment deposition, accretion, and saltmarsh growth.
- The installation of sluices on rivers flowing into the estuary has meant that the tidal influences of these rivers has been reduced.
- The alien invasive species common cordgrass (*Spartina sp.*) has caused degradation of habitats and the loss of mudflat habitat within the site.

The Proposed Development does not require any land take, reclamation or change of use of any lands within any European sites. However, the potential for degradation of wetland habitats associated with the construction phase of the works (in the absence of mitigation) has been identified. As such there is potential to result in in-combination effects on Ballymacoda Bay SPA and Ballymacoda (Clonpriest and Pilmore) SAC in the absence of mitigation.

Water in the Ballymacoda Estuary is noted as being subject to enrichment (NPWS 2014). Sources of this enrichment are thought to be associated with discharge of nutrients from agricultural activities, septic tanks and wastewater discharges. The Proposed Development requires welfare facilitates at the converter station. However, no downstream hydrological connectivity was identified between the converter station site and Ballymacoda bay. The extents of the Proposed Development with connectivity to the site is comprised of the cable route. As such, there is no potential for in-combination effects caused by enrichment associated with the proposed works.

Blackwater Estuary SPA and Blackwater River SAC

The conservation objectives supporting document for Blackwater Estuary SPA (NPWS 2014) notes the following historic activities which have caused habitat loss and degradation in habitats associated Blackwater Estuary SPA and Blackwater River SAC.

- North of Youghal an area of mudflat was reclaimed in the 19th century
- Foxhole, and the southern bank of the Tourig estuary were reclaimed historically however it is noted that some of these areas have reverted to natural habitat
- The Youghal by-pass (N25) road scheme is noted as dissecting some wetland habitat.

No potential for impacts to habitats associated with Blackwater Estuary SPA and Blackwater River SAC were identified. As such, there is no potential for in-combination effects associated with the Proposed Development. Likewise, although water quality within the designated sites are noted as being at risk, no potential for impacts causing a degradation of water quality with these European sites was identified. As such, there is no potential for in-combination effects identified in relation to either Blackwater Estuary SPA or Blackwater River SAC.

3.4 Potential for Adverse Effects on Site Integrity

Potential for Adverse Effects on Great Island Channel SAC

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs of the Great Island Channel SAC due to indirect impacts associated with the construction phase of the Proposed Development as follows:

- Potential for degradation of Mudflats and Sandflats caused by pollution of watercourses and karstic conduits
- Potential for degradation of Atlantic salt marsh due to invasive species spread

Site Specific Conservation Objectives have been developed for Great Island Channel SAC. These have been listed in section 3.3. An assessment of the potential for adverse effects on the integrity of the Great Island Channel SAC is presented hereunder in the tables below

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Table 3.17: Assessment of Potential for Adverse Effects on the site Integrity of Great Island Channel SAC – Mudflats and sandflats not covered by seawater at low tide

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	No works are proposed within areas of mudflat. There will be no direct loss of tidal mudflats and sandflats associated with the works. There is potential for surface water pollution to enter into the habitat. However, given that there will be no changes to the hydrological process which govern the sediment processes within the SAC there will be no alteration to the extent of tidal mudflats and sand flats within the SAC	No potential for adverse effects on site integrity have been identified.
Community distribution	Hectares	Conserve the following community type in a natural condition: Mixed sediment to sandy mud with polychaetes and oligochaetes community complex	The potential for pollution of watercourses with downstream connectivity has been identified. Further, the potential for release of concrete into the waters of Great Island Channel through underground conduits associated with the converter station. Changes in pH which are associated with the release of cement fines into watercourses have the potential to cause die off among invertebrate communities within the mud complexes, and an associated change in the community distribution within the site.	Impacts on the community distribution would constitute an **adverse effect on the site's integrity** in the absence of mitigation.

Table 3.18: Assessment of Potential for Adverse Effects on the site Integrity of Great Island Channel SAC – Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Bawnard - 0.29ha; Carrigatohil - 1.01ha. See map 5	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There will be no loss of salt meadow habitat area associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There will be no decline or change in habitat distribution associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified. .
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There are no physical barriers that might alter the natural circulation of sediments and organic matter associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There will be no alteration to the physical structure of the salt marsh.	No potential for adverse effects on site integrity have been identified.
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There will be no alteration to the natural tidal	No potential for adverse effects on site integrity have been identified.

			regime caused by the Proposed Development.	
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. The establishment of invasive species in these areas has the potential to cause changes to the zonation within the salt meadow habitat.	Impacts on the vegetation structure would constitute an **adverse effect on site's integrity** in the absence of mitigation. .
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. The establishment of invasive species in these areas has the potential to cause changes to the vegetation structure within the salt meadows. Where stands of Japanese knotweed and Himalayan balsam occur, there is potential for a loss of	Impacts on the structural variation would constitute an **adverse effect on site's integrity i**n the absence of mitigation.

			structural variation within the swards.	
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% area outside creeks vegetated	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. Where stands become established and die back during winter there is the potential for erosion of ground and a subsequent increase in bare earth associated.	Impacts on the vegetation cover would constitute an **adverse effect on site's integrity i**n the absence of mitigation. .
Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain range of subcommunities with typical species listed in SMP (McCorry and Ryle, 2009)	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. As these species become established there is the potential for the vegetation composition to become altered, and a loss of typical species which are associated with Salt marsh.	Impacts on the vegetation communities would constitute an **adverse effect on site's integrity i**n the absence of mitigation. .

Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1% where it is known to occur	Common cordgrass has not been identified within the footprint of the Proposed Development. Given the nature of the habitats within the footprint of the Proposed Development there is no potential for the introduction or expansion of common cordgrass as a result of the works.	No potential for adverse effects on site integrity have been identified.

Potential for Adverse Effects on Ballymacoda (Clonpriest and Pilmore) SAC

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs of the Ballymacoda (Clonpriest and Pilmore) SAC due to indirect impacts associated with the construction phase of the Proposed Development as follows:

- Potential for degradation of Estuaries caused by pollution of watercourses
- Potential for degradation of Mudflats and Sandflats caused by pollution of watercourses
- Potential for degradation of Atlantic salt marsh due to invasive species spread

Site Specific Conservation Objectives have been developed for Ballymacoda (Clonpriest and Pilmore) SAC. These have been listed in section 3.3. An assessment of the potential for adverse effects on the integrity of the Ballymacoda (Clonpriest and Pilmore) SAC is presented hereunder in the tables below.

Table 3.19: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda (Clonpriest and Pilmore) SAC – Estuaries

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	No works are proposed within areas that correspond to the Estuaries habitat. There will be no direct loss of estuary habitat associated with the works.	No potential for adverse effects on site integrity have been identified.
Community distribution	Hectares	Conserve the following community types in a natural condition: Sandy mud with *Hediste diversicolor* and *Tubificoides benedii* community; Sand with polychaetes and bivalves community complex.	The potential for pollution of watercourses with downstream connectivity has been identified Changes in pH which are associated with the release of cement fines into watercourses have the potential to cause die off among invertebrate communities within the mud complexes, and an associated change in the community distribution within the site.	Impacts on the community distribution would constitute an **adverse effect on site's integrity i**n the absence of mitigation. .

Table 3.20: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda (Clonpriest and Pilmore) SAC – Mudflats and sandflats not covered by seawater at low tide

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	No works are proposed within areas of mudflat. There will be no direct loss of tidal mudflats and sandflats associated with the works. There is potential for surface water pollution to enter into the habitat. However, given that there will be no changes to the hydrological process which govern the sediment processes within the SAC there will be no alteration to the extent of tidal mudflats and sand flats within the SAC	No potential for adverse effects on site integrity have been identified.
Community distribution	Hectares	Conserve the following community types in a natural condition: Sandy mud with Hediste diversicolor and *Tubificoides benedii community*; Sand with polychaetes and bivalves community complex	The potential for pollution of watercourses with downstream connectivity has been identified. Further, the potential for release of concrete into the waters of Great Island Channel through underground conduits associated with the converter station. Changes in pH which are associated with the release of cement fines into watercourses have the potential to cause die off among invertebrate communities within the mud complexes, and an associated change in the community distribution within the site.	Impacts on the community distribution would constitute an **adverse effect on site's integrity i**n the absence of mitigation. .

Table 3.21: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda (Clonpriest and Pilmore) SAC – Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: For sub-sites mapped: Ballymacoda- 1.57ha.	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There will be no loss of salt meadow habitat area associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There will be no decline or change in habitat distribution associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There are no physical barriers that might alter the natural circulation of sediments and organic matter associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There will be no alteration to the physical structure of the salt marsh.	No potential for adverse effects on site integrity have been identified.
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	The Proposed Development is located a significant distance from the nearest extent of salt marsh. There will be no alteration to the natural tidal regime caused by the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. The establishment of invasive species in these areas has the potential to cause changes to the zonation within the salt meadow habitat.	Impacts on the vegetation structure would constitute an **adverse effect on site's integrity i**n the absence of mitigation. .
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated	Impacts on the structural variation would constitute an **adverse effect on**

			with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. The establishment of invasive species in these areas has the potential to cause changes to the vegetation structure within the salt meadows. Where stands of Japanese knotweed and Himalayan balsam occur, there is potential for a loss of structural variation within the swards.	**site's integrity i**n the absence of mitigation.
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% area outside creeks vegetated	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. Where stands become established and die back during winter there is the potential for erosion of ground and a subsequent increase in bare earth associated.	Impacts on the vegetation cover would constitute a **negative effect on site's integrity**.
Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain range of subcommunities with typical species listed in SMP (McCorry and Ryle, 2009)	There is potential for the spread of Japanese knotweed and Himalayan balsam associated with the works. While these species are not associated with saline conditions, there is potential for stands to become established at the upper margins of the salt meadows in areas that are subject to less tidal inundation. As these species become established there is the potential for the vegetation composition to become altered, and a loss of typical species which are associated with Salt marsh.	Impacts on the vegetation communities would constitute an **adverse effect on site's integrity i**n the absence of mitigation.
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1% where it is known to occur	Common cordgrass has not been identified within the footprint of the Proposed Development. Given the nature of the habitats within the footprint of the Proposed Development there is no potential for the introduction or expansion of common cordgrass as a result of the works.	No potential for adverse effects on site integrity have been identified.

Potential for Adverse Effects on Blackwater River (Cork/Waterford) SAC

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs of the Blackwater River (Cork/Waterford) SAC due to impacts associated with the construction phase of the Proposed Development as follows:

- Potential for impacts to couches and holts which may be established prior to the construction phase of the works commencing.
- Potential for noise disturbance to otter
- Potential for impacts to food sources for otter caused by pollution of watercourses
- Potential for impacts to twaite shad caused by pollution of coastal waters
- Potential for impacts to sea lamprey caused by pollution of coastal waters

Site Specific Conservation Objectives have been developed for Blackwater River (Cork/Waterford) SAC. These have been listed in section 3.3. An assessment of the potential for adverse effects on the integrity of the Blackwater River (Cork/Waterford) SAC is presented hereunder in the tables below.

Table 3.22: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater River (Cork/Waterford) SAC – Otter (*Lutra lutra*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Distribution	Percentage positive survey sites	No significant decline	The works are largely restricted to within the road curtilage and agricultural fields. No otter holts or couches were recorded during field walkovers including river crossings. Signs of otter presence were noted in particular at river crossings. There is potential, given the habitats within Ballyvergan Marsh and along water crossings, for holts and couches to become established prior to construction of the Proposed Development. There is also potential for otters to forage and commute in the vicinity of the works areas. As such, there is potential for the works to cause disturbance resulting in the avoidance of the Proposed Development by otter. As such this may, in a worst-case scenario, result in a reduction in the percentage of positive survey sites for otters associated with Blackwater River (Cork/Waterford) SAC. However, given that these areas are not located within the boundary of the European site and well outside typical home ranges of individual Otter in this SAC, it will not result in a significant decline in the percentage of positive survey sites within the SAC.	No potential for adverse effects on site integrity have been identified.
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 103ha above high water mark (HWM); 1165.7ha along riverbanks/ around ponds	The Proposed Development is predominantly comprised of an underground cable. The exception to this is the landfall site and the converter station. The location of the converter station, and the habitats recorded therein, are such that the territories of otters associated with the Blackwater River (Cork/Waterford) SAC will not be impacted. The landfall site will require a construction adjacent to the carpark at Claycastle. This area does not, however constitute terrestrial habitat as mapped by the Conservation Objectives for Blackwater River (Cork/Waterford) SAC. Further, as the structures are belowground and will be reinstated, this does not constitute a significant decline in the habitat available to otters.	No potential for adverse effects on site integrity have been identified.
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 647.2ha	The cable where it occurs within the marine habitat is buried. There is no potential for loss of marine habitat for otter as a result of the Proposed Development.	No potential for adverse effects on site integrity have been identified.

Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 599.54km	The cable where it crosses freshwater habitat is below ground. There may be a short term restriction from these areas during construction. These will not, however be permanent and will not result in a significant decline of freshwater habitat for otter.	No potential for adverse effects on site integrity have been identified.
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 25.06ha	No works are required within any lakes. There is no potential for any loss of lake habitat for otters as a result of the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Couching sites and holts	Number	No significant decline	The works are largely restricted to within the road curtilage and agricultural fields. No otter holts or couches were recorded during field walkovers. There is potential, however, given the habitats in proximity to the landfall area, within Ballyvergan Marsh, and along water crossings, for holts and couches to become established prior to construction of the Proposed Development. As such there is potential for the works to result in a decline in the number of couching sites and holts for otter associated with the SAC.	Impacts on the number of couching sites and holts would constitute an **adverse effect on site's integrity i**n the absence of mitigation.
Fish biomass available	Kilograms	No significant decline	There is the potential for the accidental release of cement fines into the coastal waters at Claycastle. The associated changes in pH have the potential to result in mortality to fish upon which otters might prey.	Impacts on the fish biomass available to otter would constitute a **negative effect on the site's integrity i**n the absence of mitigation.
Barriers to connectivity	Number	No significant increase	The Proposed Development is predominantly comprised of an underground cable. The exception to this is the landfall site and the converter station. Neither the landfall site, nor the converter station constitute a barrier to connectivity to otter. There may be a short term restriction of watercourses due to temporary works within the channel during construction. These will not, however be permanent and will not result in a significant decline of freshwater habitat for otter.	No potential for adverse effects on site integrity have been identified.

Table 3.23: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater River (Cork/Waterford) SAC – Twaite Shad (*Alosa fallax*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	There are no freshwater waterbodies that are associated with Blackwater River (Cork/Waterford) SAC that will be impacted by the proposed development. As such, there is no potential for loss of river accessibility for twaite shad.	No potential for adverse effects on site integrity have been identified.
Population structure: age classes	Number of age classes	More than one age class present	There is the potential for the accidental release of cement fines into the coastal waters at Claycastle. The associated changes in pH have the potential to result in mortality to fish in the vicinity of the works. Given that twaite shad have been recorded in the waters near of Blackwater Estuary it cannot be ruled out that the fish may be present in proximity to the landfall area. As such, having regard to the precautionary principle, it must be assumed that should an accidental spill occur, that there Is potential for significant loss of twaite shad. Any loss of fish has the potential for an alteration in age class of the population. Despite this, the loss of fish from the waters of Claycastle will not preclude multiple age classes of fish being present within the SAC.	No potential for adverse effects on site integrity have been identified.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning habitats	Spawning habitat for twaite shad is located in the freshwater reaches of the Blackwater Estuary (Cork/Waterford) SAC. There is no potential for impact to the freshwater extent of the SAC as the works are not within the SAC boundary, and no downstream connectivity is present to these areas. There is, accordingly, no potential for a loss of spawning habitat associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified.
Water quality: oxygen levels	Milligrammes per litre	No lower than 5mg/l	There is potential for a release of pollution to adjacent coastal waters associated with the works. However, the release of sediment laden water into the coastal waters which are already sediment rich will not result in a decrease in oxygen levels. Likewise, while the release of cement fines has the potential to result in a drop in pH within the water column there is no potential for it to cause a reduction in oxygen levels. There is, therefore, no potential for alteration in oxygen levels caused by the Proposed Development in waterbodies associated with Twaite Shad.	No potential for adverse effects on site integrity have been identified.

Spawning habitat quality: Filamentous algae; macrophytes; sediment	Occurrence	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plant) growth	Spawning habitat for twaite shad is located in the freshwater reaches of the Blackwater Estuary (Cork/Waterford) SAC. There is no potential for impact to the freshwater extent of the SAC as the works are not within the SAC boundary, and no downstream connectivity is present to these areas. There is no potential for a degradation in spawning habitat quality associated with the Proposed Development.	No potential for adverse effects on site integrity have been identified.

Table 3.24: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater River (Cork/Waterford) SAC – Sea Lamprey (*Petromyzon marinus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	There are no freshwater waterbodies associated with Blackwater River (Cork/Waterford) SAC. As such, there is no potential for loss of river accessibility for sea lamprey.	No potential for adverse effects on site integrity have been identified.
Population structure of juveniles	Number of age/size groups	At least three age/size groups present	There is the potential for the accidental release of cement fines into the coastal waters at Claycastle. The associated changes in pH have the potential to result in mortality to lamprey in the vicinity of the works. Given that sea lamprey have been recorded in the waters of Blackwater Estuary it cannot be ruled out that the fish may be present in proximity to the landfall area. As such, having regard to the precautionary principle, it must be assumed that should an accidental spill occur, that there Is potential for significant loss of sea lamprey. Any loss of individuals has the potential for an alteration in age class of the population. Despite this, the loss of sea lamprey from the waters of Claycaslte will not preclude multiple age classes being present within the SAC.	No potential for adverse effects on site integrity have been identified.
Juvenile density in sediment	Juveniles/m²	Juvenile density at least 1/m²	Sea lamprey spawn in freshwater rivers. The juveniles remain in freshwater until they reach the adult phase of the life cycle. At this point sea lamprey migrate to the sea where they feed on other dish species. The works are outside of any freshwater extent of the blackwater river (Cork/Waterford SAC). In addition, there is no downstream connectivity with these watercourses. As such, there is no potential for impact to juvenile lamprey associated with the Proposed Development	No potential for adverse effects on site integrity have been identified.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning habitats	Spawning habitat for sea lamprey is located in the freshwater reaches of the Blackwater Estuary (Cork/Waterford) SAC. There is no potential for impact to the freshwater extent of the SAC as the works are not within the SAC boundary, and no downstream connectivity is present to these areas.	No potential for adverse effects on site integrity have been identified.
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive.	Juvenile habitat for sea lamprey is located in the freshwater reaches of the Blackwater Estuary (Cork/Waterford) SAC. There is no potential for impact to the freshwater extent of the SAC as the works are not within the SAC boundary, and no downstream connectivity is present to these areas.	No potential for adverse effects on site integrity have been identified.

Potential for Adverse Effects on Cork Harbour SPA

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs of the Cork Harbour SPA due to impacts associated with the construction phase of the Proposed Development as follows:

Potential for direct impact to ex situ supporting habitat for teal, grey heron, black-headed gull and lesser black-backed gull

- Degradation of wetland habitat within the SPA boundary caused by pollution/sedimentation
- Potential for noise and visual disturbance (from machinery and personnel presence) to the following species:
  - Bar tailed godwit
  - Black headed gull
  - Common gull
  - Cormorant
  - Curlew
  - Dunlin
  - Grey heron
  - Lesser black-backed gull
  - Teal -
  - Turnstone
  - Lapwing
  - Oystercatcher
  - Redshank
  - Wigeon
- Degradation of supporting habitat caused by invasive species spread

Site Specific Conservation Objectives have been developed for Cork Harbour SPA. These have been listed in section 3.3. An assessment of the potential for adverse effects on the integrity of Cork Harbour SPA is presented hereunder.

Table 3.25: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Bar-tailed Godwit (*Limosa lapponica*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. While the species may occur on occasion in proximity to the landfall area, bar-tailed godwits were recorded foraging entirely in study areas outside of the ZoI for noise impacts. The localised temporary disturbance of bar-tailed godwit from the Claycastle area does not have the potential to constitute a long term decrease in population.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, the species may occur on occasion in proximity to the landfall are. However, bar-tailed godwits were recorded foraging entirely in study areas outside of the ZoI for noise impacts. As such, there is no indication that the landfall area constitutes a foraging The disturbance of such low numbers of bar-tailed godwit at Claycastle does not, therefore, have the potential to constitute a significant decrease in the range, timing or intensity of use of areas by bar tailed godwit.	No potential for adverse effects on site integrity have been identified

Table 3.26: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Black-headed gull (*Chroicocephalus ridibundus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak numbers of black-headed gulls were recorded during marine bird surveys at the Claycastle landfall location. Wintering bird survey report for wintering season 2019/2020 (Nagle 2020) notes in relation to Claycastle that "*Small numbers of Black-headed Gull were recorded in each month (apart from March) with peak numbers of 17 and 18 recorded in November and January*." The report goes on to state that "*The Black-headed Gull is probably the most numerous and widespread gull in Ireland. It is an opportunistic species that avails of feeding opportunities on freshwaters, estuaries in marine and terrestrial areas and they commonly feed at ploughed fields, abattoirs, fish factories, sewage outfalls, rubbish dumps (Crowe 2005).*" As such, disturbance of black-headed gulls from the works locations will not result in a lack of key foraging options for the species. There is, therefore, no potential for a long-term decrease in the population trend for the species caused by the works.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-headed gull other than that occurring from natural patterns of variation	Black-headed gulls (peak two) were recorded in the converter station site, and at Claycastle (peak 18). The disruption of black-headed gulls from the converter station or other locations does not have potential to result in a significant decrease in the range, timing or intensity of use of areas by black-headed gull.	No potential for adverse effects on site integrity have been identified.

Table 3.27: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Common Gull (*Larus canus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak common gull numbers were recorded during 2019/2020 wintering survey. The bird survey report (Nagle 2020) notes that "*A peak of 27 Common Gulls was recorded during low tide in November and smaller numbers were recorded in each of the five sections throughout the count period. Common Gulls are opportunistic feeders and are unlikely to be seriously impacted by pipe-laying activities at Claycastle*" As such, disturbance of common gulls from the works locations will not result in a lack of key foraging options for the species. There is, therefore, no potential for a long-term decrease in the population trend for the species caused by the works.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by common gulls, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, low numbers and the opportunistic nature of common gulls are such that they are unlikely to be significantly impacted As such, disturbance of common gulls from the works locations will not result in a significant decrease in the range, timing or intensity of use of areas by common gulls.	No potential for adverse effects on site integrity have been identified

Table 3.28: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Cormorant (*Phalacrocorax carbo*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak numbers of eight cormorants were recorded during the marine wintering bird surveys between 2019/2020. The survey report notes that the majority of birds recorded were either in flight or feeding off shore. As such, disturbance of cormorant from the works area at Claycastle will not result in a lack of key foraging options for the species. There is, therefore, no potential for a long-term decrease in the population trend for the species caused by the works.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by cormorant, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, records of cormorant are such that the area surrounding the landfall location is not of great importance in terms of foraging habitat. As such, disturbance of cormorant from the works locations will not result in a significant decrease in the range, timing or intensity of use of areas by cormorant.	No potential for adverse effects on site integrity have been identified

Table 3.29: Assessment of Potential for Adverse Effects on the site Integrity of Cork harbour SPA – Curlew (*Numenius arquata*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. The wintering bird survey 2019/2020 (Nagle 2020) recorded peak curlew numbers. The survey noted in relation to curlew that: "…*Curlew, was recorded in varying numbers each month (apart from January) with a peak.. recorded in February…*"*Numbers tended to build up over the winter period and peak numbers were recorded in the late winter period (February and March). Birds were recorded moving between the reed-free area within the marsh and the fields adjacent to the western perimeter of the marsh."* The report goes on to state that "*There is a possibility of disturbance and displacement of Curlew at Ballyvergan Marsh in February and March by pipe-laying activity in the east of the marsh depending on noise emission levels.* The report notes that in the event of disturbance the curlew would likely move to nearby fields outside of the zone of disturbance. Given that the birds regularly make use of Ballyvergan marsh, the disruption of birds from this area has the potential to result in a significant decrease in the intensity of use of habitat at Ballyvergan marsh during construction. However, this disruption is unlikely to result in a decrease in fitness for the SPA population such that the long term population trend decreases.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, curlew were recorded in the vicinity of the works area. However, in the event of disturbance the curlew would likely move to nearby fields outside of the zone of disturbance. Given that the birds regularly make use of Ballyvergan marsh, the disruption of birds from this area for extended periods of time during the construction phase has the potential to result in a temporary decrease in the intensity of use of habitat at Ballyvergan marsh during construction. Japanese knotweed has been recorded within the works areas in Ballyvergan marsh. There is potential for the unintentional spread of the species further into the habitats at Ballyvergan, This has the potential to result in the permanent degradation of supporting habitat for curlew within	Impacts on the intensity of use of foraging habitat used by curlew would constitute **a negative effect on the site's integrity in the absence of mitigation.**

	the marsh. This may further cause a reduction in usage of the area, as its carrying capacity reduces.

Table 3.30: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Dunlin (*Calidris alpina alpina*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak count of one dunlin was recorded during the 2019/2020 wintering bird surveys. No dunlin were recorded during the 2019 surveys. The bird survey report for Claycastle (Nagle 2020) notes in relation to dunlin that the species was recorded "*on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species"* The disturbance of a single dunlin from the Claycastle area does not have the potential to constitute a long term decrease in population.	No potential for Adverse Effects on Site Integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As noted previously, the bird survey report for Claycastle states in relation to dunlin that the species was recorded "*on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species"* There will be no loss or degradation of significant foraging or roosting habitat for dunlin caused by the works. The disturbance of such low numbers of dunlin at Claycastle does not, therefore, have the potential to constitute a significant decrease in the range, timing or intensity of use of areas by dunlin.	No potential for Adverse Effects on Site Integrity have been identified

Table 3.31: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Grey Heron (*Ardea cinerea*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A single grey heron was recorded in the proposed Converter Station Site (referred to as Ballyadam in the report). The wintering bird survey report (2019/2020) notes in relation to the converter station generally "*The site does not appear to be an important location for wetland birds in the winter due to the very limited areas of suitable habitat and Ballyadam is not likely to be of any great significance to the species of Special Conservation Interest in the nearby Cork Harbour SPA*." In relation to counts at Claycastle, again, peak counts of one heron were recorded. Temporary disturbance (construction phase) of small numbers of grey heron from the converter station and other possible habitat (ponds, Ballyvergan Marsh etc) does not have potential to result in a long-term population trend decrease. Grey heron will continue to use the area.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey heron, other than that occurring from natural patterns of variation	As previously noted, a single grey heron was recorded in the converter station site, and peak counts of one gery heron were recorded at Claycastle. The disruption of a single grey heron from the converter station does not have potential to result in a significant decrease in the range, timing, or intensity of use of areas by grey heron.	No potential for adverse effects on site integrity have been identified.

Table 3.32: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Grey Plover (*Pluvialis squatarola*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Peak counts of one grey plover were recorded during the 2019/2020 wintering bird survey. This bird was recorded outside of the ZoI of the proposed development, in section 1. This indicates that the area surrounding the landfall is not of importance for the species in terms of foraging or roosting areas. Temporary disturbance (construction phase) of small numbers of grey plover from the landfall area does not have potential to result in a long-term population trend decrease.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey plover, other than that occurring from natural patterns of variation	As previously noted, a single grey plover was recorded in the converter station site. The disruption of a single grey plover from landfall area does not have potential to result in a significant decrease in the range, timing, or intensity of use of areas by grey plover.	No potential for adverse effects on site integrity have been identified.

Table 3.33: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Lapwing (*Vanellus vanellus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of lapwing associated with the Cork harbour SPA to occur within the ZoI in this area. There is potential for the temporary disruption of lapwing from the proposed from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long-term reduction in fitness that has potential to result in a long-term population trend reduction.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lapwing, other than that occurring from natural patterns of variation	Lough Aderry and Ballybutler pNHA is known to support wintering populations of lapwing. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of lapwing from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by lapwing would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.34: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Lesser Black-backed gull (*Larus fuscus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. A peak count of 6 lesser black-backed gulls were recorded within the converter station site. The report notes *"On one occasion, 6 Lesser Black-backed Gulls were seen flying over the site, landing briefly and then flying out of the site. The overall dry nature of Ballyadam with its rank, uncultivated grassland, large areas of exposed stone and very little open water make this site largely unattractive to gulls of any species and consequently, Lesser Black-backed Gulls are very unlikely to be seriously impacted by any development at the site."* A peak count of 34 lesser black backed gulls were recorded at claycastle during the 2019/2020 wintering bird survey. It is of note, however that these were only recorded in flight over the site in strong winds. As such, the claycastle area does not appear to be of importance for foraging or roosting lesser black backed gulls. The disruption such lesser black-backed gulls from these areas does not. Therefore, have potential to result in a long-term population trend decrease for lesser black-backed gull.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lesser black-backed gull, other than that occurring from natural patterns of variation	As previously noted, a peak count of 6 lesser black-backed gulls were recorded within the converter station site, while 34 were recorded in flight at claycsastle. As such, disturbance of gulls from these areas does not have potential to result in a significant decrease in the range, timing or intensity of use of areas by lesser black-backed gull.	No potential for adverse effects on site integrity have been identified.

Table 3.35: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Oystercatcher (*Vanellus vanellus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A peak count of 36 individuals was recorded to the east of the landfall area during the winter bird surveys carried out 2019/2020 season. The birds were recorded roosting on a grassy hill to the east of the proposed pipe-laying site in November. The survey report notes that these regularly occurring birds have become habituated to human related disturbance and their natural response is to fly to less disturbed stretches of beach. Given the level of habituation these birds have displayed there is no potential for the temporary disturbance from Claycastle beach to cause a long-term decrease in population trend,	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation	As previously noted, a peak of 36 individuals was recorded close to the landfall location. The survey report notes that oystercatcher are a regularly occurring bird in the area. The disruption of birds from this area has potential to result in a reduction of use of the area by the spcies.	Impacts on the intensity of use of areas used by oystercatcher would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.36: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Teal (*Anas crecca*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A peak count of ten teal were recorded in the converter station site (referred to as Ballyadam in the report). The survey report (Nagle 2020) notes that the Teal within the site are "*confined to the pond on the western perimeter and are unlikely to be impacted by construction work in most other parts of the site. The small population of Teal is likely to be a discrete population that winters on the site as they were recorded in the same location during each of the surveys*." This pond is outside of the footprint of the works at the proposed converter station and will not be impacted by the development. Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of teal associated with the Cork harbour SPA to occur within the ZoI in this area. Teal were recorded in Ballyvergan Marsh on occasion in section 2. The bird surveys indicate that the Ballyvergan Marsh is not a regular foraging area for the species. No teal were recorded within survey sections that fall within the ZoI for noise disturbance. There is potential for the temporary disruption of teal from the proposed Converter Station Site, and from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long term reduction in fitness that has potential to result in a long term population trend reduction. .	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by teal, other than that occurring from natural patterns of variation	As previously noted, a peak count of ten individuals were recorded in the converter station site "*confined to the pond on the western perimeter "* As such, while there is potential for a disturbance for teal within the wider Ballyadam/IDA site, given the number of birds impacted, and the fact that Ballyadam/IDA site does not constitute optimal habitat for the species, this disruption does not constitute a significant loss for the species. No teal were recorded within survey sections that fall the ZoI for noise. Further, the bird survey results indicate that the area surrounding the	Impacts on the intensity of use of foraging habitat used by teal would constitute **a negative effect on the site's integrity in the absence of mitigation.**

		landfall area is not of regular use for the species. As such, any noise impacts associated with the works do not constitute a significant disruption for the species. Lough Aderry and Ballybutler pNHA is known to support wintering populations of teal. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of teal from a regular winter foraging area.

Table 3.37: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Turnstone (*Arenaria interpres*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Peak counts of 26 turnstone were recorded during the 2019/2020 wintering bird survey. These birds were recorded outside of the ZoI of the proposed development, in section 1. This indicates that the area surrounding the landfall is not of importance for the species in terms of foraging or roosting areas. Temporary disturbance (construction phase) of small numbers of turnstone from the landfall area does not have potential to result in a long-term population trend decrease.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by turnstone, other than that occurring from natural patterns of variation	As previously noted, 26 turnstone were recorded in the converter station site. The disruption of a turnstone from landfall area does not have potential to result in a significant decrease in the range, timing, or intensity of use of areas by turnstone.	No potential for adverse effects on site integrity have been identified.

Table 3.38: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Redshank (*Tringa totanus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak counts of nine individuals were recorded during 2019 wintering bird survey (Glas Ecology 2019). This indicates that the area is not of importance for redshank in terms of foraging or roosting habitat. As such, the localised temporary disturbance of very low numbers of redshank from the Claycastle area does not have the potential to constitute a long-term decrease in population.	No potential for Adverse Effects on Site Integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. There will be no loss or degradation of significant foraging or roosting habitat for dunlin caused by the works. The disturbance of low numbers of dunlin at Claycastle does not, have the potential to constitute a significant decrease in the range, timing or intensity of use of areas by redshank.	No potential for Adverse Effects on Site Integrity have been identified

Table 3.39: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Wigeon (*Anas penelope*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of wigeon associated with the Cork harbour SPA to occur within the ZoI in this area. There is potential for the temporary disruption of lapwing from the proposed from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long-term reduction in fitness that has potential to result in a long-term population trend reduction.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by wigeon, other than that occurring from natural patterns of variation	Lough Aderry and Ballybutler pNHA is known to support wintering populations of wigeon. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of wigeon from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by wigeon would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.40: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA –Wetlands

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat Area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,587 hectares, other than that occurring from natural patterns of variation	The Proposed Development has the potential to result in a deterioration in water quality caused by accidental pollution of surface waters, and through release of concrete through underground conduits. This has the potential to result in a degradation of mudflat and sandflat habitats associated with the SPA. These mudflat habitats for key foraging habitat for a large number of birds associated with the SPA. Further, there is the potential for accidental spread of invasive species into the SPA boundary during the works. These invasive species have the potential to cause degradation of salt marshes within the SPA which are utilised by wildfowl. The associated reduction in wetland quality has the potential to result in a lowering of the carrying capacity for wetland birds. However, this will not constitute a reduction in the permanent area occupied by wetland habitats.	No potential for adverse effects on site integrity have been identified.

Potential for Adverse Effects on Ballymacoda Bay SPA

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs of the due to impacts associated with the construction phase of the Proposed Development as follows:

- Direct impact to ex situ supporting habitat for wintering ringed plover, sanderling, dunlin, black-headed gull, common gull, lesser black backed gull, and curlew
- Deterioration in supporting habitat within the European Site boundary due to water quality impacts
- Noise disturbance impacts to the following bird species:
  - Black-headed gull
  - Common gull
  - Curlew
  - Dunlin
  - Grey Plover
  - Lapwing
  - Lesser black backed gull
  - Ringed plover
  - Sanderling
  - Teal
  - Turnstone
  - Wigeon
- Degradation of supporting habitat for SCIs caused by invasive species spread

Site Specific Conservation Objectives have been developed for Ballymacoda Bay SPA. These have been listed in section 3.3. An assessment of the potential for adverse effects on the integrity of Ballymacoda Bay SPA is presented hereunder in the tables below.

Table 3.41: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Black-headed gulls (*Chroicocephalus ridibundus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak numbers of black-headed gulls were recorded during marine bird surveys at the Claycastle landfall location. Wintering bird survey report for wintering season 2019/2020 (Nagle 2020) notes in relation to Claycastle that "*Small numbers of Black-headed Gull were recorded in each month (apart from March) with peak numbers of 17 and 18 recorded in November and January*." The report goes on to state that "*The Black-headed Gull is probably the most numerous and widespread gull in Ireland. It is an opportunistic species that avails of feeding opportunities on freshwaters, estuaries in marine and terrestrial areas and they commonly feed at ploughed fields, abattoirs, fish factories, sewage outfalls, rubbish dumps (Crowe 2005).*" As such, disturbance of black-headed gulls from the works locations will not result in a lack of key foraging options for the species. There is, therefore, no potential for a long-term decrease in the population trend for the species caused by the works.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-headed gulls, other than that occurring from natural patterns of variation	Black-headed gulls (peak two) were recorded in the converter station site, and at Claycastle (peak 18). The disruption of black-headed gulls from the converter station or other locations does not have potential to result in a significant decrease in the range, timing or intensity of use of areas by black-headed gull.	No potential for adverse effects on site integrity have been identified.

Table 3.42: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Common Gull (*Larus canus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak common gull numbers were recorded during 2019/2020 wintering survey. The bird survey report (Nagle 2020). The bird survey report (Nagle 2020) notes that "*A peak of 27 Common Gulls was recorded during low tide in November and smaller numbers were recorded in each of the five sections throughout the count period. Common Gulls are opportunistic feeders and are unlikely to be seriously impacted by pipe-laying activities at Claycastle*" As such, disturbance of common gulls from the works locations will not result in a lack of key foraging options for the species. There is, therefore, no potential for a long-term decrease in the population trend for the species caused by the works.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by common gulls, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, low numbers and the opportunistic nature of common gulls are such that they are unlikely to be significantly impacted As such, disturbance of common gulls from the works locations will not result in a significant decrease in the range, timing or intensity of use of areas by common gulls.	No potential for adverse effects on site integrity have been identified.

Table 3.43: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Curlew (*Numenius arquata*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. The wintering bird survey 2019/2020 (Nagle 2020) recorded peak curlew numbers. The survey noted in relation to curlew that: "…*Curlew, was recorded in varying numbers each month (apart from January) with a peak.. recorded in February…"Numbers tended to build up over the winter period and peak numbers were recorded in the late winter period (February and March). Birds were recorded moving between the reed-free area within the marsh and the fields adjacent to the western perimeter of the marsh."* The report goes on to state that "*There is a possibility of disturbance and displacement of Curlew at Ballyvergan Marsh in February and March by pipe-laying activity in the east of the marsh depending on noise emission levels.* The report notes that in the event of disturbance the curlew would likely move to nearby fields outside of the zone of disturbance. Given that the birds regularly make use of Ballyvergan marsh, the disruption of birds from this area has the potential to result in a significant decrease in the intensity of use of habitat at Ballyvergan marsh during construction. However, this disruption is unlikely to result in a decrease in fitness for the SPA population such that the long term population trend decreases.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, curlew were recorded in the vicinity of the works area. However, in the event of disturbance the curlew would likely move to nearby fields outside of the zone of disturbance. Given that the birds regularly make use of Ballyvergan marsh, the disruption of birds from this area for extended periods of time during the construction phase has the potential to result in a temporary decrease in the intensity of use of habitat at Ballyvergan marsh during construction. Japanese knotweed has been recorded within the works areas in Ballyvergan marsh. There is potential for the unintentional spread of the species further into the habitats at Ballyvergan, This has the potential to result in the permanent degradation of supporting habitat for curlew within	Impacts on the intensity of use of foraging habitat used by Curlew would constitute a **negative effect on the site's integrity**.

	the marsh. This may further cause a reduction in usage of the area, as its carrying capacity reduces.

Table 3.44: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Dunlin (*Calidris alpina alpina*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak count of one dunlin was recorded during the 2019/2020 wintering bird surveys. No dunlin were recorded during the 2019 surveys. The bird survey report for Claycastle (Nagle 2020) notes in relation to dunlin that the species was recorded "*on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species"* The disturbance of a single dunlin from the Claycastle area does not have the potential to constitute a long term decrease in population.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As noted previously, the bird survey report for Claycastle states in relation to dunlin that the species was recorded "*on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species"* There will be no loss or degradation of significant foraging or roosting habitat for dunlin caused by the works. The disturbance of such low numbers of dunlin at Claycastle does not, therefore, have the potential	No potential for adverse effects on site integrity have been identified.

	to constitute a significant decrease in the range, timing or intensity of use of areas by dunlin.

Table 3.45: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Grey Plover (*Pluvialis squatarola*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Peak counts of one grey plover were recorded during the 2019/2020 wintering bird survey. This bird was recorded outside of the ZoI of the proposed development, in section 1. This indicates that the area surrounding the landfall is not of importance for the species in terms of foraging or roosting areas. Temporary disturbance (construction phase) of small numbers of grey plover from the landfall area does not have potential to result in a long-term population trend decrease.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey plover, other than that occurring from natural patterns of variation	As previously noted, a single grey plover was recorded in the converter station site. The disruption of a single grey plover from landfall area does not have potential to result in a significant decrease in the range, timing, or intensity of use of areas by grey plover.	No potential for adverse effects on site integrity have been identified.

Table 3.46: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Lapwing (*Vanellus vanellus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of lapwing associated with the Ballymacoda Bay SPA to occur within the ZoI in this area. There is potential for the temporary disruption of lapwing from the proposed from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long-term reduction in fitness that has potential to result in a long-term population trend reduction.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lapwing, other than that occurring from natural patterns of variation	Lough Aderry and Ballybutler pNHA is known to support wintering populations of lapwing. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of lapwing from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by lapwing would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.47: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Lesser black-backed gull (*Larus fuscus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. A peak count of 6 lesser black-backed gulls were recorded within the converter station site. The report notes "*On one occasion, 6 Lesser Black-backed Gulls were seen flying over the site, landing briefly and then flying out of the site. The overall dry nature of Ballyadam with its rank, uncultivated grassland, large areas of exposed stone and very little open water make this site largely unattractive to gulls of any species and consequently, Lesser Black-backed Gulls are very unlikely to be seriously impacted by any development at the site.*" A peak count of 34 lesser black backed gulls were recorded at claycastle during the 2019/2020 wintering bird survey. It is of note, however that these were only recorded in flight over the site in strong winds. As such, the claycastle area does not appear to be of importance for foraging or roosting lesser black backed gulls. The disruption such lesser black-backed gulls from these areas does not. Therefore, have potential to result in a long-term population trend decrease for lesser black-backed gull.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lesser black-backed gulls, other than that occurring from natural patterns of variation	As previously noted, a peak count of 6 lesser black-backed gulls were recorded within the converter station site, while 34 were recorded in flight at claycsastle. As such, disturbance of gulls from these areas does not have potential to result in a significant decrease in the range, timing or intensity of use of areas by lesser black-backed gull.	No potential for adverse effects on site integrity have been identified.

Table 3.48: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA - Ringed Plover

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A peak count of 20 ringed plover were recorded at high tide counts at the Redbarn-Claycastle sites. Ringed plover were also recorded during marine bird surveys at Claycastle (a peak count of 12 was recorded). The numbers of ringed plover recorded at Claycastle as a proportion of the 1% national population threshold for ringed plover is low, and not indicative of an important foraging area for the birds. There will be no permanent loss of foraging or roosting habitat for the species. Further, the site is highly disturbed due to the level of recreational activities ongoing year-round at the site. On this basis, the disturbance of low numbers of ringed plover from this area does not have potential to result in a long-term decrease in population trends for the species.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by ringed plover, other than that occurring from natural patterns of variation	The Proposed Development location is such that there is no potential for disturbance to birds foraging or roosting in core habitats within the boundary of the SPA. There is potential for temporary disturbance of ringed plover from the works areas at the landfall and at Ballyvergan marsh. This disturbance, from these disturbed areas would not constitute a significant decrease in the range, timing or intensity of use of areas by ringed plover.	No potential for adverse effects on site integrity have been identified.

Table 3.49: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA - Sanderling

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Sanderling were recorded in proximity to the landfall site with a peak count of 50 recorded at high tide counts in November 2019, and 159 recorded during marine surveys in March. The Proposed Development has potential to result in localised temporary disturbance to sanderling in proximity to the landfall area. This is a relatively low proportion of the total habitat available to Sanderling, in the context of Claycastle beach, and the wider Ballymacoda bay. As such, the disturbance of these birds from the landfall area will not result in their avoidance of a key foraging or roosting area. There is no potential, therefore, for a reduction in the long-term population trends for the species.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by sanderling, other than that occurring from natural patterns of variation	The Proposed Development location is such that there is no potential for disturbance to birds foraging or roosting in core habitats within the boundary of the SPA. There is potential for disturbance of sanderling from the works areas at Claycastle. This disturbance, from the works areas would not constitute a significant decrease in the range, timing or intensity of use of areas by sanderling.	Impacts on the intensity of use of foraging habitat used by sanderling would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.50: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Teal (*Anas crecca*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A peak count of ten teal were recorded in the converter station site (referred to as Ballyadam in the report). The survey report (Nagle 2020) notes that the Teal within the site are "*confined to the pond on the western perimeter and are unlikely to be impacted by construction work in most other parts of the site. The small population of Teal is likely to be a discrete population that winters on the site as they were recorded in the same location during each of the surveys*." This pond is outside of the footprint of the works at the proposed converter station and will not be impacted by the development. Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of teal associated with the Ballymacoda Bay SPA to occur within the ZoI in this area. Teal were recorded in Ballyvergan Marsh on occasion in section 2. The bird surveys indicate that the Ballyvergan Marsh is not a regular foraging area for the species. No teal were recorded within survey sections that fall within the ZoI for noise disturbance. There is potential for the temporary disruption of teal from the proposed Converter Station Site, and from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long term reduction in fitness that has potential to result in a long term population trend reduction. .	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by teal, other than that occurring from natural patterns of variation	As previously noted, a peak count of ten individuals were recorded in the converter station site "*confined to the pond on the western perimeter "* As such, while there is potential for a disturbance for teal within the wider Ballyadam/IDA site, given the number of birds impacted, and the fact that Ballyadam/IDA site does not constitute optimal habitat for the species, this disruption does not constitute a significant loss for the species. No teal were recorded within survey sections that fall the ZoI for noise. Further, the bird survey results indicate that the area surrounding the	Impacts on the intensity of use of foraging habitat used by teal would constitute **a negative effect on the site's integrity in the absence of mitigation.**

		landfall area is not of regular use for the species. As such, any noise impacts associated with the works do not constitute a significant disruption for the species. Lough Aderry and Ballybutler pNHA is known to support wintering populations of teal. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of teal from a regular winter foraging area.

Table 3.51: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA – Turnstone (*Arenaria interpres*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Peak counts of 26 turnstone were recorded during the 2019/2020 wintering bird survey. These birds were recorded outside of the ZoI of the proposed development, in section 1. This indicates that the area surrounding the landfall is not of importance for the species in terms of foraging or roosting areas. Temporary disturbance (construction phase) of small numbers of turnstone from the landfall area does not have potential to result in a long-term population trend decrease.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by turnstone, other than that occurring from natural patterns of variation	As previously noted, 26 turnstone were recorded in the converter station site. The disruption of a turnstone from landfall area does not have potential to result in a significant decrease in the range, timing, or intensity of use of areas by turnstone.	No potential for adverse effects on site integrity have been identified.

Table 3.52: Assessment of Potential for Adverse Effects on the site Integrity of Cork Harbour SPA – Wigeon (*Anas penelope*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of wigeon associated with the Ballymacoda Bay SPA to occur within the ZoI in this area. There is potential for the temporary disruption of wigeon from the proposed from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long-term reduction in fitness that has potential to result in a long-term population trend reduction.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by wigeon, other than that occurring from natural patterns of variation	Lough Aderry and Ballybutler pNHA is known to support wintering populations of wigeon. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of lapwing from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by wigeon would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.53: Assessment of Potential for Adverse Effects on the site Integrity of Ballymacoda Bay SPA –Wetlands

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat Area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 602 hectares, other than that occurring from natural patterns of variation	The Proposed Development has the potential to result in a deterioration in water quality caused by accidental pollution of surface waters. This has the potential to result in a degradation of mudflat and sandflat habitats associated with the SPA. These mudflat habitats for key foraging habitat for a large number of birds associated with the SPA. Further, there is the potential for accidental spread of invasive species into the SPA boundary during the works. These invasive species have the potential to cause degradation of salt marshes within the SPA which are utilised by wildfowl however this is very unlikely to be at a level of risk above current baseline. The associated reduction in wetland quality has the potential to result in a lowering of the carrying capacity for wetland birds. However, this will not constitute a reduction in the permanent area occupied by wetland habitats.	No potential for adverse effects on site integrity have been identified.

Potential for Adverse Effects on Blackwater Estuary SPA

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs of the due to impacts associated with the construction phase of the Proposed Development as follows:

- Direct impact to ex situ supporting habitat (Claycastle beach and Ballyvergan) for wintering curlew, dunlin, bar-tailed godwit and redshank.
- Noise and visual disturbance to wintering dunlin, curlew, redshank, teal, wigeon and lapwing

Site Specific Conservation Objectives have been developed for Blackwater Estuary SPA. These have been listed in section 3.3. An assessment of the potential for adverse effects on the integrity of Blackwater Estuary SPA is presented hereunder

Table 3.54: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater Estuary SPA – Bar-tailed Godwit (*Limosa lapponica*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. While the species may occur on occasion in proximity to the landfall area, bar-tailed godwits were recorded foraging entirely in study areas outside of the ZoI for noise impacts. The localised temporary disturbance of bar-tailed godwit from the Claycastle area does not have the potential to constitute a long-term decrease in population.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by bar-taled godwit, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, the species may occur on occasion in proximity to the landfall are. However, bar-tailed godwits were recorded foraging entirely in study areas outside of the ZoI for noise impacts. As such, there is no indication that the landfall area constitutes a foraging The disturbance of bar-tailed godwit at Claycastle does not, therefore, have the potential to constitute a significant decrease in the range, timing or intensity of use of areas by bar tailed godwit.	No potential for adverse effects on site integrity have been identified

Table 3.55: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater Estuary SPA – Curlew (*Numenius arquata*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. The wintering bird survey 2019/2020 (Nagle 2020) recorded peak curlew numbers. The survey noted in relation to curlew that: "*…Curlew, was recorded in varying numbers each month (apart from January) with a peak recorded in February…"Numbers tended to build up over the winter period and peak numbers were recorded in the late winter period (February and March). Birds were recorded moving between the reed-free area within the marsh and the fields adjacent to the western perimeter of the marsh."* The report goes on to state that "*There is a possibility of disturbance and displacement of Curlew at Ballyvergan Marsh in February and March by pipe-laying activity in the east of the marsh depending on noise emission levels.* The report notes that in the event of disturbance the curlew would likely move to nearby fields outside of the zone of disturbance. Given that the birds regularly make use of Ballyvergan marsh, the disruption of birds from this area has the potential to result in a significant decrease in the intensity of use of habitat at Ballyvergan marsh during construction. However, this disruption is unlikely to result in a decrease in fitness for the SPA population such that the long term population trend decreases.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, curlew were recorded in the vicinity of the works area. However, in the event of disturbance the curlew would likely move to nearby fields outside of the zone of disturbance. Given that the birds regularly make use of Ballyvergan marsh, the disruption of birds from this area for extended periods of time during the construction phase has the potential to result in a temporary decrease in the intensity of use of habitat at Ballyvergan marsh during construction. Japanese knotweed has been recorded within the works areas in Ballyvergan marsh. There is potential for the unintentional spread of the species further into the habitats at Ballyvergan, This has the	Temporary (construction phase) Impacts on the intensity of use of foraging habitat used by curlew would possibly constitute a **negative effect on the site's integrity**.

			potential to result in the permanent degradation of supporting habitat for curlew within the marsh. This may further cause a reduction in usage of the area, as its carrying capacity reduces.	

Table 3.56: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater Estuary SPA – Dunlin (*Calidris alpina alpina*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak count of one dunlin was recorded during the 2019/2020 wintering bird surveys. No dunlin were recorded during the 2019 surveys. The bird survey report for Claycastle (Nagle 2020) notes in relation to dunlin that the species was recorded "*on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species"* The disturbance of a single dunlin from the Claycastle area does not have the potential to constitute a long term decrease in population.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As noted previously, the bird survey report for Claycastle states in relation to dunlin that the species was recorded "*on one occasion during the count period and only a single bird was recorded. Redbarn-Claycastle clearly does not appear to be a significant foraging or roosting site for this species"* There will be no loss or degradation of significant foraging or roosting habitat for dunlin caused by the works. The disturbance of such low numbers of dunlin at Claycastle does not, therefore, have the potential to constitute a significant decrease in the range, timing or intensity of use of areas by dunlin.	No potential for adverse effects on site integrity have been identified

Table 3.57: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater Estuary SPA – Bar-tailed Godwit (*Limosa lapponica*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Records of Bar-tailed godwit were restricted to areas outside of the Zone of Impact for noise disturbance. The localised temporary disturbance of bar-tailed godwit from the Claycastle area does not have the potential to constitute a long-term decrease in population.	No potential for Adverse Effects on Site Integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. The disturbance of such low numbers of bar-tailed godwit at Claycastle does not, therefore, have the potential to constitute a significant decrease in the range, timing or intensity of use of areas by dunlin.	No potential for Adverse Effects on Site Integrity have been identified

Table 3.58: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater Estuary SPA – Redshank (*Tringa totanus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Peak counts of two individuals were recorded during 2019/2020 wintering bird surveys. This indicates that the area is not of importance for redshank in terms of foraging or roosting habitat. As such, the localised temporary disturbance of very low numbers of redshank from the Claycastle area does not have the potential to constitute a long-term decrease in population.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. There will be no loss or degradation of significant foraging or roosting habitat for dunlin caused by the works. The disturbance of low numbers of redshank at Claycastle does not, have the potential to constitute a significant decrease in the range, timing or intensity of use of areas by redshank.	No potential for adverse effects on site integrity have been identified

Table 3.59: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater Estuary SPA – Lapwing (*Vanellus vanellus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of lapwing associated with the Blackwater Estuary SPA to occur within the ZoI in this area. There is potential for the temporary disruption of lapwing from the proposed from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long-term reduction in fitness that has potential to result in a long-term population trend reduction.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lapwing, other than that occurring from natural patterns of variation	Lough Aderry and Ballybutler pNHA is known to support wintering populations of lapwing. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of lapwing from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by lapwing would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Table 3.60: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater Estuary SPA – Teal (*Anas crecca*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	A peak count of ten teal were recorded in the converter station site (referred to as Ballyadam in the report). The survey report (Nagle 2020) notes that the Teal within the site are "*confined to the pond on the western perimeter and are unlikely to be impacted by construction work in most other parts of the site. The small population of Teal is likely to be a discrete population that winters on the site as they were recorded in the same location during each of the surveys*." This pond is outside of the footprint of the works at the proposed converter station and will not be impacted by the development. Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of teal associated with the Blackwater Estuary SPA to occur within the ZoI in this area. Teal were recorded in Ballyvergan Marsh on occasion in section 2. The bird surveys indicate that the Ballyvergan Marsh is not a regular foraging area for the species. No teal were recorded within survey sections that fall within the ZoI for noise disturbance. There is potential for the temporary disruption of teal from the proposed Converter Station Site, and from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long term reduction in fitness that has potential to result in a long term population trend reduction.	No potential for adverse effects on site integrity have been identified.
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by teal, other than that occurring from natural patterns of variation	As previously noted, a peak count of ten individuals were recorded in the converter station site "*confined to the pond on the western perimeter "* As such, while there is potential for a disturbance for teal within the wider Ballyadam/IDA site, given the number of birds impacted, and the fact that Ballyadam/IDA site does not constitute optimal habitat for the species, this disruption does not constitute a significant loss for the species. No teal were recorded within survey sections that fall within the ZoI for noise. Further, the bird survey results indicate that the area surrounding the landfall area is not of regular use for the species. As	Impacts on the intensity of use of foraging habitat used by teal would constitute **a negative effect on the site's integrity in the absence of mitigation.**

		such, any noise impacts associated with the works do not constitute a significant disruption for the species. Lough Aderry and Ballybutler pNHA is known to support wintering populations of teal. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of teal from a regular winter foraging area.

Table 3.61: Assessment of Potential for Adverse Effects on the site Integrity of Blackwater Estuary SPA – Wigeon (*Anas penelope*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	Lough Aderry and Ballybutler pNHA is located along the side of the existing N25. The proposed cable route runs along the northern edge of the lake for approximately 350m. There is potential for ex situ populations of wigeon associated with the Blackwater Estuary SPA to occur within the ZoI in this area. There is potential for the temporary disruption of lapwing from the proposed from Lough Aderry and Ballybutler pNHA. Given that the works are temporary in nature they will not result in a long-term reduction in fitness that has potential to result in a long-term population trend reduction.	No potential for adverse effects on site integrity have been identified
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by wigeon, other than that occurring from natural patterns of variation	Lough Aderry and Ballybutler pNHA is known to support wintering populations of wigeon. Given that there is potential for works to take place along the edge of the pNHA during the wintering season, there is potential for disturbance of wigeon from a regular winter foraging area.	Impacts on the intensity of use of foraging habitat used by wigeon would constitute **a negative effect on the site's integrity in the absence of mitigation.**

Potential for Adverse Effects on Mullaghanish to Musheramore Mountains SPA

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development is likely to impact the QIs during the construction phase of the Proposed Development as follows:

- Disturbance to wintering hen harrier associated with the site.

No site-specific conservation objectives have been developed for Mullaghanish to Musheramore Mountains SPA. At the time of writing, the NPWS had not designated site-specific objectives for any of the Irish Hen Harrier SPAs.

Generic conservation objectives have been set out and are as follows:

To maintain or restore the favourable conservation condition of the bird species listed as SCIs for this SPA

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Having regard to these objectives, an assessment of the potential for adverse effects on the integrity of Mullaghanish to Musheramore Mountains SPA is presented hereunder

Hen harrier (*Circus cyaneus*)

The Proposed Development is located a significant distance from Mullaghanish to Musheramore Mountains SPA. As such, there is no potential for damage or degradation to habitats within the SPA boundary.

As previously noted, hen harrier have been found to migrate outside of breeding grounds to winter roosting areas between October and March (Watson 1977, Clarke & Watson 1990). Birdwatch Ireland (2020) note that the species "*spends winter in more coastal and lowland areas throughout Irela*nd".

As previously outlined, Wintering bird surveys carried out in February and March 2019(Glas Ecology 2019) carried out between November 2019 to March 2020 (Nagle 2020) recorded hen harrier at Ballyvergan. The surveys reported roosting hen harrier on multiple occasions. The roost surveys indicate that the hen harriers within Ballyvergan marsh have a preference for the western side of the marsh and may occur within 700m of the Proposed Development. While it is not clear where the birds migrate to for the breeding season, having regard to the precautionary principal it is assumed that these are associated with the Mullaghanish to Musheramore Mountains SPA

The wintering bird survey report goes on to state that there is potential for"*… disturbance to roosting Hen Harriers at Ballyvergan Marsh during pipe-laying activities on the east side of the marsh if noise levels are likely to be persistently high in the late afternoon period between November and March*." Disturbance of wintering hen harrier has the potential to result in a lack of fitness and reduced associated capacity for breeding.

Disturbance to wintering hen harrier associated with Mullaghanish to Musheramore Mountains SPA, and degradation of ex situ supporting habitat for the species would constitute a **negative effect on the site's integrity**.

Summary

Potential project-related impacts likely to adversely affect integrity of the following European sites are summarised below as follows:

- **Great Island Channel SAC**
  - Impacts to **mudflats and sandflats not covered by seawater at low tide** due to pollution of watercourses
  - Impacts to **Atlantic salt meadows** (*Glauco-Puccinellietalia maritimae*) caused by accidental spread of **invasive species**
- **Ballymacoda (Clonpriest and Pilmore) SAC**
  - Impacts to **Estuaries** due to pollution of watercourses
  - Impacts to **mudflats and sandflats not covered by seawater at low tide** due to pollution of watercourses
  - Impacts to **Atlantic salt meadows** (*Glauco-Puccinellietalia maritimae*) caused by accidental spread of **invasive species**
- **Blackwater River (Cork/Waterford) SAC**
  - Impacts (disturbance during construction) to **otter couches and holts, and reduction in fish biomass** due to water quality impacts

  Cork Harbour SPA
  - Impacts to **wintering curlew, teal, and lapwing** caused by disturbance and degradation of ex situ supporting habitat
- **Ballymacoda Bay SPA**
  - Impacts to **wintering curlew, lapwing, sanderling, teal and wigeon** caused by disturbance and degradation of ex situ supporting habitat
- **Blackwater Estuary SPA**
  - Impacts to **wintering curlew, teal and lapwing** caused by disturbance and degradation of ex situ supporting habitat
- **Mullaghanish to Musheramore Mountains SPA**
  - Impacts to wintering **hen harrier** caused by visual and noise disturbance during construction phase in Ballyvergan marsh.

3.5 Mitigation

Mitigation is prescribed hereunder to address the impacts identified such that adverse effects on site integrity of the European site do not occur.

Mitigation measures are set out in accordance with the European Commission guidance on the '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, (2001). Mitigation is described with respect to:

- how the measures will avoid / prevent / reduce the adverse impacts on the site to an acceptable level;
- the degree of confidence in their likely success;
- the timescale, relative to the project, when they will be implemented;
- how and when the measures will be monitored.

All mitigation prescribed in this NIS must be implemented by the appointed Contractor for the works, in consultation with the Developer's Ecologist, and the relevant statutory bodies identified hereunder. The Contractor will incorporate the mitigation measures being outlined below into a Construction Environmental Management Plan (CEMP) for the project, and agree the CEMP with the Developer and the local authority in advance of mobilisation.

3.5.1 Mitigation Against Water Quality Impacts to Surface Water

The principle likely pollution sources from construction activities are from water crossings associated with the cable route. Other sources are contaminated site run-off, including silty water arising from exposed ground / stockpiles / and from accidental leaks / spills of oil / fuels from machinery or storage areas, and run off from areas where concrete pours are taking place.

Mitigation measures to avoid / prevent contaminated runoff and pollution from site are prescribed in below.

Table 3.62: Mitigation against surface water pollution

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
At a minimum, all pollution control measures will be designed, installed, and maintained in accordance with measures outlined below and under the supervision of an Environmental Clerk of Works (EnCoW) whom shall be appointed by the Contractor. **Concrete** The pouring of concrete will be required during the construction phase. To prevent the runoff of concrete into nearby watercourses and drains, the following will be implemented. • No on-site batching will be permitted at the proposed works areas. Concrete will instead be transported to the site within a concrete truck. • Quick setting concrete mixes will be used to reduce the risk of contaminated run-off to the nearby watercourses. • Concrete trucks will be washed down in a sealed mortar bin / skip which has been examined in advance for any defects. This requirement will be communicated to each concrete truck driver prior to entering into the works area. • Where concrete pours are to take place instream they will only take place within an isolated, dry, works area. • Where the isolated working area requires constant pumping to maintain a dry works area, pumps shall be turned off during the pour, and remain off until it can be ensured that the discharge will not result in a change in pH of +/-0.5 units.	Measures will prevent the uncontrolled releases of pollutants into the environment.	Measures prescribed as best practice and are proven technologies / methods.	Pollution prevention measures will need to be in place before the enabling and construction works commence at each location.	The EnCoW will carry out ongoing monitoring of all pollution control measures	Measures will prevent the uncontrolled releases of pollutants into the environment.

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
• Where concrete pours are required within a watercourse, the EnCoW will continually monitor the pH of the watercourse during concrete works. Should any change in pH +/-0.5 be detected concrete works shall immediately be ceased. The entry point to the watercours will then be identified and implement appropriate measures to prevent further escape to the environment. • It will be ensured that covers are available for freshly poured concrete to avoid wash off in the event of rain. • Waste concrete slurry will be allowed to dry and taken to a licensed waste depot for disposal. • Concrete works will be scheduled during dry weather conditions to reduce the elevated risk of runoff. • NPWS and IFI will be notified immediately of any concrete spills into watercourses. **Hydrocarbons** Where mobile equipment is required e.g. generators, these will be housed in a suitably sized bund / plant nappy such that any leaks / spills are intercepted. All mobile equipment used will be stored within a plant nappy. Operators will regularly inspect the plant nappy, at a minimum on a daily basis, and replace it where it has become contaminated. Fuelling and lubrication of plant and equipment will be restricted to the construction compound sites, or laydown areas. No refuelling will be permitted to occur within 50m of any watercourse or drainage ditch.					

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
All waste fuels, oils, and other hazardous wastes will be disposed of in accordance with the requirements of waste legislation. Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained during induction to site by the EnCoW in the use of this equipment. Should use of a spill-kit be required it shall be immediately re-stocked. All spill-kits shall be inspected on a weekly basis by the SHEQ officer to ensure they are maintained as fit for purpose. Records relating to these inspections shall be kept. Welfare / hygiene facilities will be located within the construction compounds. All water from wheel washes will be removed from site and disposed of in line with Waste Legislation. No wheel wash water will be discharged into any watercourses or drainage ditches.					

Table 3.63: Mitigation Proposed for Watercourse crossings

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
Surface Water Protection for Open Trench Water Crossings Where open trench crossings are to be carried out there is a risk of downstream transportation of pollutants caused by the works. At a minimum, the following measures shall be undertaken where trenchless construction methods are utilised for crossings • Works at each watercourse crossing shall be monitored by the EnCoW. • Prior to works commencing at each watercourse sediment control measures shall be put in place to prevent run-off associated with the vegetation clearance needed to facilitate the crossing. The clearance of riparian vegetation will be kept to the minimum required for the facilitation of the works such that no unnecessary exposure of riverbanks occurs. • Measures to prevent the downstream transportation of surface water run off associated with vegetation clearance shall be installed prior to the works commencing. This may be through the use of features like hay bales, or silt booms and will be dependent on the size of the watercourse, and the water levels at the time of construction. Monitoring of these measures to ensure their continued effectiveness will take place on an on-going basis while the works are proceeding. • Works to clear vegetation shall take place from the bank with vegetation pulled back towards the land. The vegetation removed shall be transported off site and disposed of appropriately. • Following the vegetation clearance, a dry works area shall be established. The measures required to achieve this must be appropriate for the size and flow associated with each watercourse. This may be achieved by:	Measures will ensure all impacts associated with open trench construction are controlled and .	Measures prescribed as best practice and are proven technologies / methods.	Pollution prevention measures will need to be in place before the construction works commence	The EnCoW will carry out ongoing monitoring of all pollution control measures.	Measures will ensure all impacts associated with open trench construction are controlled and managed.

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
– Isolating the entire watercourse and over pumping the flow. The outflow of any over pumped river shall be placed such that there is no scouring of the riverbed. This will be monitored on an on-going basis by the EnCoW. Should scouring be identified the EnCoW will oversee the moving of the outflow such that scouring does not occur. – Isolating half of the watercourse through the use of measures such as sandbags or aqua dams and diverting the flow around the works area. • Prior to works commencing the isolated area shall be inspected by the EnCoW to ensure that the watercourse is sufficiently protected. The EnCoW will record all works authorisations, report these to the Employers Rep, and maintain on file for inspection as required • Should pumping out of the isolated area be required to maintain the dry works area, it shall be ensured that any discharge is treated appropriately prior to entering the watercourse. This may be achieved by discharging to a treatment system such as a silt buster or similar, discharge to a silt bag, or discharging to an area of the watercourse that is protected by a silt boom. These measures shall be used in combination where ground conditions are such that just one measure is not achieving sufficient protection. The success of these measures shall be monitored regularly by the EnCoW as works proceed at the watercourse crossings. • Where the implementation of these measures fail, or are inadequate, the Contractor will implement adapted measures in agreement with the ENCOW and the Employers Rep, • Any diversion or over pumping of watercourses shall be sized such that they will accommodate such flood event as might reasonably be expected (minimum 1% AEP). over the period in question, so as to prevent the overtopping of work areas.					

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
Surface Water Protection for HDD Water Crossings Where open trench crossings are to be carried out there is a risk of pollution caused by run off and frack out associated with the works. At a minimum, the following measures shall be undertaken where trenchless construction methods are utilised for crossings. • The Contractor will prepare a trenchless construction Method Statement which will outline the standard approach for the trenchless construction. The Method Statement will include a contingency plan for break-out and for excessive ground settlement. The Method Statement will be agreed with IFI, and the Employer's Representative on site before construction commences. • The Contractor will undertake the trenchless construction in accordance with industry best practice including *British Standard EN 16191:2014 Tunnelling machinery. Safety requirements* and *CIRIA C648 Control of water pollution from linear construction projects Technical Guidance.* • To prevent loss of bentonite or 'frack out' from occurring a series of actions will be implemented. The drill fluids operator will monitor drill fluid density, viscosity and solids content on an ongoing basis, to ensure that the fluid does not increase in viscosity, requiring additional pressure to maintain mobility. In cases where a risk of frack out is identified, viscometers will be used to measure drill fluid gel strength and shear strength. Filtrate can also be measured to calculate the amount of filter cake building up on the internal wall of the bore. Any increases in pump pressure experienced by the drill operator will be investigated immediately to prevent the risk of pressure build up within the annulus. In some circumstances, dependant on the drilling equipment used, the pilot drill borehole assembly will be fitted with a down hole pressure monitor to measure pressure in the annulus between the drill and the bore wall. This will give an early indication of pressure build up in the hole and allow the drill	Measures will ensure all impacts associated with trenchless construction are controlled and managed.	Measures prescribed as best practice and are proven technologies / methods.	Pollution prevention measures will need to be in place before the construction works commence	The EnCoW will carry out daily monitoring of all pollution control measures. Constant monitoring of the drilling operations will be carried out by the contractor.	Measures will ensure all impacts associated with trenchless construction are controlled and managed.

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
operator to prevent a 'break-out'. If there is a risk of a 'frack-out' a number of measures will be implemented including (1) pumping a pill of drilling fluid with a higher density to the risk zone (2) circulate and pump loss circulation material (typically cork or manufactured inert polymers) to the risk zone to seal the risk zone, grouting of the risk zone, and, or launch a packer before the risk zone. • Monitoring of the drilling operations will be undertaken at all times by the Contractor. The monitoring will include visual inspection of the pits and monitoring of the volume of returns flowing back to the entry pit. The monitoring personnel will be in constant communication with the drilling rig operator and thus will be able to immediately cease drilling if necessary. • In addition, the EnCOW will undertake sediment monitoring both upstream and downstream of the trenchless construction works using a calibrated handheld turbidity and pH meter. • In the event that an accumulation of water occurs within the HDD entry and exit pits, all water will be pumped out using submersible pumps. This water will not be permitted to discharge directly back into any watercourses untreated. Instead, given that the entrance and exit pits are set back from watercourses, the water will be permitted to infiltrate to ground where free of potential contaminants or removed from site for disposal by an appropriately permitted contractor.					

3.5.2 Mitigation Against Contamination of Underground Conduits

There is potential for the release of concrete associated with piling activities at the Converter Station. Mitigation measures to avoid / prevent underground conduit contamination from works associated with the development are prescribed below.

Table 3.64: Mitigation Against Contamination of Underground Conduits

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
Cast in situ concrete piles will be installed in the Converter station site. Given the karst nature of the site, the following mitigation is proposed in order to prevent contamination of ground water. The contractor shall develop a Piling Risk Assessment and Environmental Management Plan which will confirm how the works will be executed, and will form part of the CEMP. The plan will include, at a minimum, the implementation of a robust monitoring programme, and an action plan to mitigate environmental incidents. The management plan shall be submitted by the Contractor to the Employers Representative Team, and the relevant authorities for discussion and acceptance prior to the commencement of piling activities at Ballyadam. The Contractor shall monitor the drilling of the piles to determine the depth and occurrence of soft or voided ground which could be indicative of karst features. Casings will be used during the piling activities. Where there is the potential for encountering of karst features, casings will left in situ to prevent leaching of concrete into underground voids. Where alternative methodologies are available to the contractor that will ensure protection of underlying karst features, these may also be incorporated provided they will achieve the same or better level of groundwater protection.	The measures will prevent the ingress of concrete into underground karst features.	Measures prescribed as best practice and are proven technologies / methods.	CEMP shall be in place prior to the commencement of works at the Converter station. .	The EnCoW will carry out daily monitoring, or more regularly, as determined by the Contractor in consultation with the Developer and the relevant authorities, of all pollution control measures Constant monitoring of the drilling operations will be carried out by the contractor.	Measures will ensure all impacts associated with concrete piling are controlled and managed.

3.5.4 Mitigation Against Disturbance to Wintering Birds

The principle likely disturbance from construction activities are from works within or in close proximity to Ballyvergan Marsh. Mitigation measures to avoid / prevent noise disturbance form works associated with the development are prescribed in below.

Table 3.65: Mitigation Against Disturbance to Wintering Hen Harrier

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
The potential for disturbance to hen harriers has been identified for works at Claycastle, within Ballyvergan Marsh, and at the road alongside the marsh where works proceed at early morning or late afternoon between November and March inclusive. Restrictions of high-noise level operations, (e.g. rock breaking and piling) to outside of arrival and departure times as outlined by O'Donoghue 2021 i.e. commencing work no earlier than 50 minutes before sunrise and concluding 90 minutes before sunset. During the works monitoring for hen harrier shall take place by the EnCow.. Should hen harrier be observed returning to a roost, works shall cease until the bird has left. Details pertaining to hen harrier activities and subsequent requirements for work stoppage will be recorded daily and provided to the Developer's Ecologist and Local Authority on a weekly basis.	The measures will remove the potential for disturbance to wintering hen harrier during the works.	Measures prescribed as best practice and are proven technologies / methods.	On-going throughout the works between November and March inclusive.	The EnCoW will carry out daily monitoring of noise reduction measures. Ongoing monitoring during the day for hen harrier returning.	Measures will ensure all impacts associated with noise disturbance are controlled and managed.

Table 3.66: Mitigation Against Disturbance to Wintering Waterfowl

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
• Prior to the commencement of the works, a sound reducing hoarding shall be placed along works areas adjacent to Ballyvergan Marsh, at Claycastle ,beach and along the roadside at Loughs Aderry and Ballybutler.. This will help to reduce the noise impacts associated with the construction phase of the works. • The barrier material shall have a mass per unit area exceeding 7kg/m2 in accordance with the recommendations of BS 5228 Part 1:2009+A1:2014 Part B.4. • All plant used during the construction phase shall be the quietest of its type practical for achieving the works. • All plant shall be operated and maintained in accordance with the manufacturer's recommendations including the use and maintenance of any specific noise reduction measures. • At a minimum the following will be incorporated to reduce the impact further: – The use of mufflers on pneumatic tools – Effective exhaust silencers – Sound reducing enclosures – Pumps and static mechanical plant shall be enclosed by acoustic sheds or screens – Machines in intermittent use shall be shut down during periods where they are not required	The provision of such sound reduction measures will reduce the zone of impact	Measures prescribed as best practice and are proven technologies / methods.	Sound reduction hoarding will need to be in place before the construction works commence Implementation of plant specific noise reduction to take place on an ongoing basis.	. The EnCoW will carry out daily monitoring of noise reduction measures. Monitoring of ongoing noise levels to be carried out on a continuous basis during works at Ballyvergan Marsh and at Claycastle beach.	Measures will ensure all impacts associated with noise disturbance are controlled and managed.

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
• During works at Claycastle and adjacent to Ballyvergan marsh noise levels will be monitored. Should noise levels within the reed swamp exceed 70dBA works will cease and measures taken to reduce sound levels to below this threshold.					

3.5.5 Measures to Mitigate Against the Spread of Invasive Plant Species

It is an offence under Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) (S.I. No. 477 of 2011) to plant, disperse, allow, or cause to disperse, spread or otherwise cause to grow any plant species specified in the Third Schedule of the Regulations.

Japanese knotweed, Himalayan balsam, three cornered leek and sea buckthorn have all been recorded in proximity to the development. In order to comply with the regulations, the appointed Contractor will ensure biosecurity measures are implemented during the construction phase to ensure the introduction and/or spread of invasive species is prevented. Biosecurity measures which will be implemented during the construction phase are prescribed in Table 3.67 below.

Table 3.67: Mitigation Against Spread of Invasive Species

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
Japanese knotweed, Himalayan balsam, three cornered leek, and sea buckthorn have all been recorded in proximity to the development. There is potential for additional stands of invasive species to be present within or adjacent to the works areas. • Prior to works commencing a full invasive species survey will be carried out. The pre-construction invasive species survey will be carried out within the works areas, including compound locations and laydown areas, and along proposed access routes to identify the presence of all invasive species within and adjacent to works areas. • The invasive species survey will be carried out during the appropriate growing season. • The findings of this invasive species survey will be incorporated into an Invasive Species Management Plan for the works. This plan will be developed by the contractor's EnCoW and agreed with the Developer's Ecologist and the Local Authority. • The Invasive Species Management Plan shall be in place prior to any works commencing. The Invasive Species Management Plan will be a live document, regularly reviewed and updated throughout the works to include for any additional invasive species encountered. • The Invasive Species Management Plan will set out site-specific and species-specific measures to manage invasive species. • Any stands of invasive species that recorded within the site will be clearly marked out as restricted areas. This exclusion zone will incorporate a buffer such that below ground growth is accounted for (7m as precautionary buffer for Japanese knotweed, not required for other species). No works will be carried out within	The biosecurity measures will ensure the spread of invasive species is avoided and managed.	Measures prescribed as best practice and are proven technologies / methods.	Biosecurity measures will be implemented throughout the duration of the construction works.	The EnCoW will inspect and monitor all biosecurity measures to ensure they are undertaken correctly.	Measures will ensure all impacts associated invasive species spread are controlled and managed.

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
the exclusion zones unless fully supervised by the EnCoW. • The appointed EnCoW will carry out a toolbox talk for all construction personnel which will provide information on how to identify and manage invasive species. The toolbox talk will take place prior to works commencing in any areas where Invasive Species have been recorded. • The EnCoW will also implement additional biosecurity measures on site such as the visual inspection of vehicles for evidence of attached plant or animal, or debris which may contain same prior to entering and leaving the works area. • Where works are carried out within watercourses, all machinery will be inspected and will be completely dry prior to works commencing to prevent the risk of pathogen spread. All machinery will be cleaned following completion of the works.					

3.6 Conclusion

The mitigation measures detailed in Section 3.6 of this NIS will ensure no adverse effects on the integrity of any European sites in light of the site's conservation objectives

Based on the assessment of the Proposed Development alone and in combination with other projects and plans, including the implementation of mitigation measures, it can be concluded that no adverse effects on the integrity of any European sites will arise, in view of the site's conservation objectives.

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A. Consultation Response

B. Habitat Map of Proposed Development

C. Map of Development in Relation to European Sites